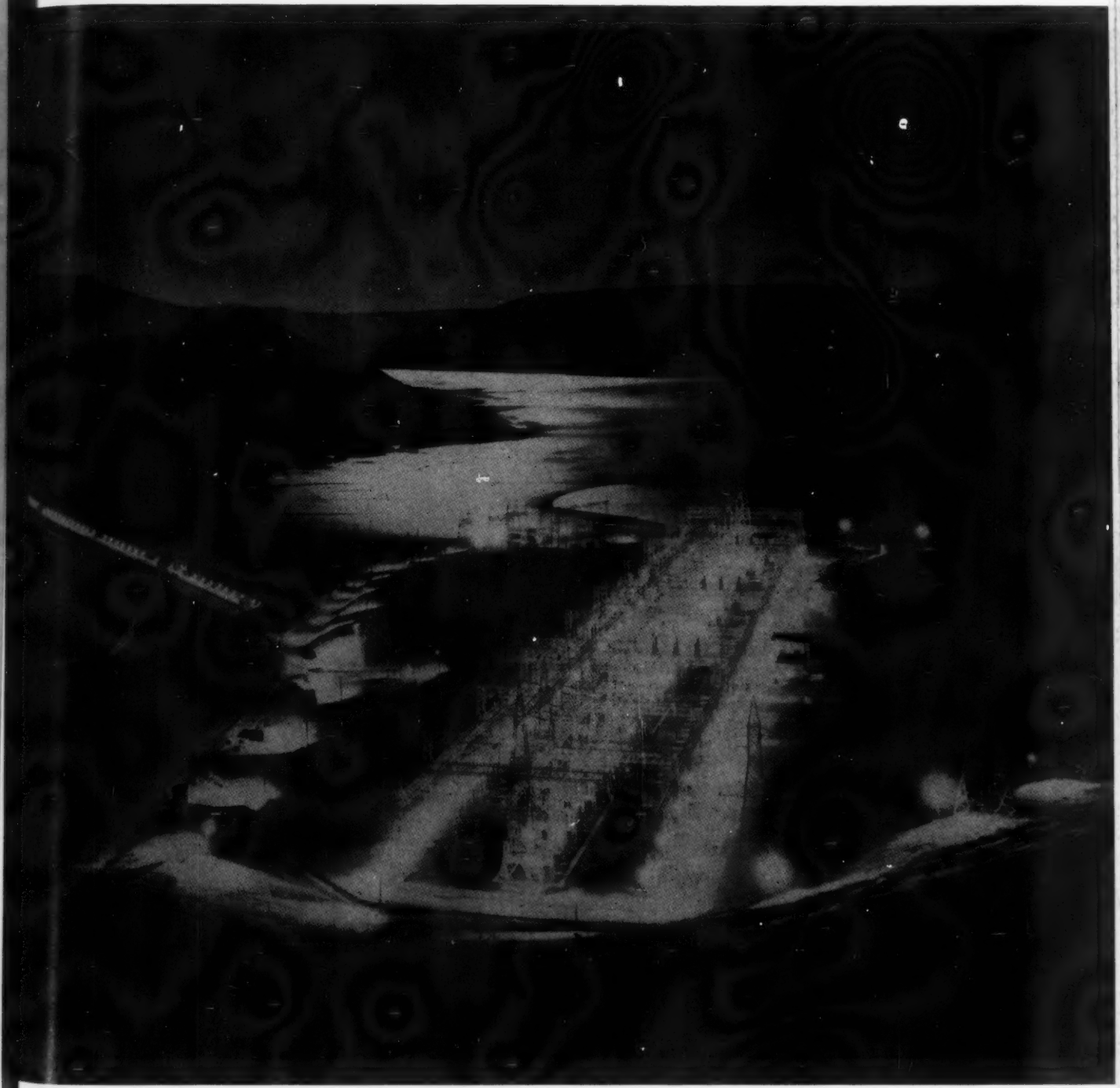
ELECTRICAL WEST

March, 1947
25 cents



How to Handle Stubborn People, page 45
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HOW TO FLY YOUR KITES
Safely
Kite flying time
IS HE
Kite Flyers!
WHAT'S WRONG WITH THIS PICTURE?
Boys and Girls:
FLY YOUR KITES
Safely
SOUTHERN CALIFORNIA
Edison

what's new in GE street lighting

Sodium lamp life EXTENDED 33%

NOW it is more economical than ever before to use distinctive, modern sodium lighting! Thanks to a new cathode developed by General Electric, you can now count on sodium lamps for an *extra* 1000 hours of service.

Yes, the life rating of General Electric sodium lamps has been extended from 3000 to 4000 hours—***at no extra cost to you.*** Your replacement costs are less. Service calls are fewer—and farther apart. In tunnels, where operation is continuous, the new lamp is rated at 8000 hours.

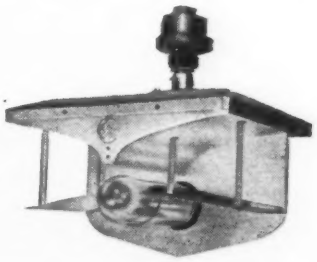
The ideal safety lighting for danger spots

With the *extra economy* of General Electric's new sodium lamps, you have more reason than ever to take advantage of the *extra safety* of this modern type of lighting. Type M-2 sodium luminaires are highly efficient distributors of penetrating, caution-colored, easy-on-the-eyes light. They relieve the blinding effect of bright oncoming headlights, and outline pedestrians and traffic conditions long distances ahead. In many cities sodium lighting has markedly reduced accident rates—at intersections, in tunnels, over bridges and along busy highways.

Easy to install

Modern, attractive General Electric luminaires can be mounted according to any conventional arrangements used for standard incandescent luminaires. Circuit wiring can be overhead or underground. Lamps operate on any conventional series or multiple circuit.

A.F. Dickerson, manager of the General Electric Lighting Division, Schenectady, N. Y., examines the new cathode.



GENERAL ELECTRIC

452-43-3010

GOOD STREET LIGHTING BUILDS GOOD WILL

This new sodium lamp is one of many developments which General Electric has pioneered to help you provide better street lighting at less cost. For additional information call our nearest office or write to *Apparatus Department, General Electric Co., Schenectady 5, N. Y.*

Are you tying in with the NEMA plan to give America better street lighting?

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity". Contents Copyright. Sixtieth year of publication.

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MARCH, 1947 Vol. 98, No. 3

ELECTRICAL WEST

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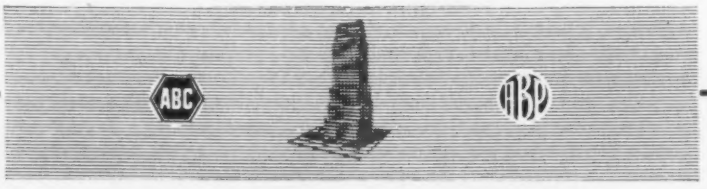

HEAT PUMPS

In the works is a timely survey of the heat pump situation. It wasn't so many years ago that the name heat pump itself needed explaining, and it took a deal of argument to convince anyone that there was such a device and that it actually worked.

The heat-pump principle has subsequently been well set forth to the magazine reading members of the industry, but heretofore the data have been entertaining rather than useful, except to a few men connected with special jobs.

Now the heat-pump has boomed into the electrical picture as a full-blown production item. Electrical West's survey is aimed to describe its status quo, present data pertaining to the practicability and economics of the heat pump as a central station load.

LOOK QUICKLY

Along with other measures to speed up tempo and save readers' time, betokened also by the restyling of this and other pages in this issue, ELECTRICAL WEST is devoting a page a month to a quick- reading appraisal of the month's news, tall tales and highlights. Busy readers please turn to page 94.

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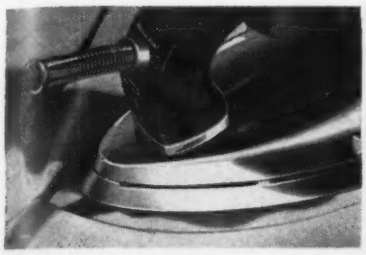
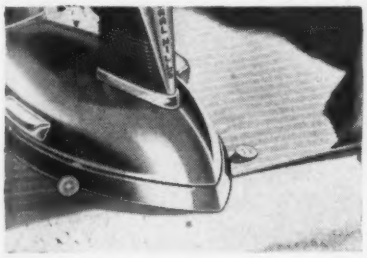
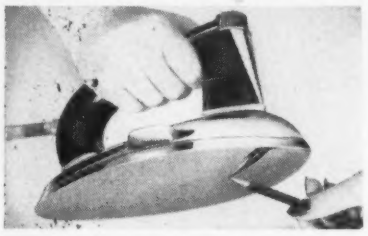
Extra large 4-way Full-vue ironing surface speeds ironing



TAPERED, ROUNDED BACK means faster, easier ironing because *either* end of the iron reaches easily, surely, into tricky pleats, ruffles and gathers without twisting or turning the iron around.

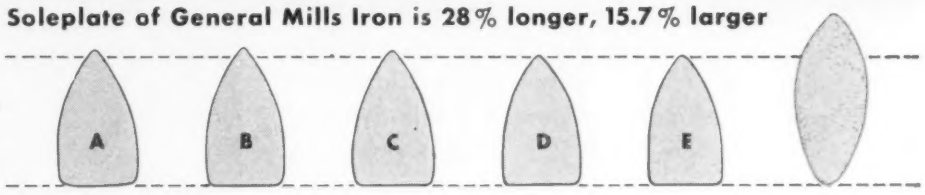


BUTTON SAVER EDGE means easier ironing under buttons. It's slanted all around so every part of it slips easily under buttons without prying them loose or weakening the threads.



TRU-HEAT CONTROL means faster ironing, greater safety for delicate fabrics because it's the fastest-acting, most accurate known type of iron heat control. (The soleplate itself is actually a part of this new, more accurate ironing temperature regulator.)

Soleplate of General Mills Iron is 28% longer, 15.7% larger



EXTRA LENGTH, EXTRA AREA MEANS LESS WORK, more ironing at every stroke, fewer motions, speedier ironing. The 4-Way, Full-Vue Ironing Surface of the General Mills Tru-Heat Iron is 15.7% larger, 28% longer than the average of five other leading irons—as shown in the actual scale diagram above. Its new shape lets the iron glide smoothly in any direction without bunching up material.

THE NEW

General Mills Tru-Heat Iron

SPONSORED BY

Betty Crocker

NOW BEING DISTRIBUTED IN: Minnesota, Nebraska, the Dakotas, Wisconsin, Iowa, Michigan, Indiana, Ohio, the New England States, New York, Montana, Wyoming, Utah, Colorado, New Mexico, New Jersey, Delaware, Maryland, Virginia, North Carolina, District of Columbia, Pennsylvania, and parts of Idaho, Illinois, Kentucky and West Virginia.

GENERAL MILLS, INC., HOME APPLIANCE DEPT., 1620 CENTRAL AVE., MINNEAPOLIS 13, MINNESOTA

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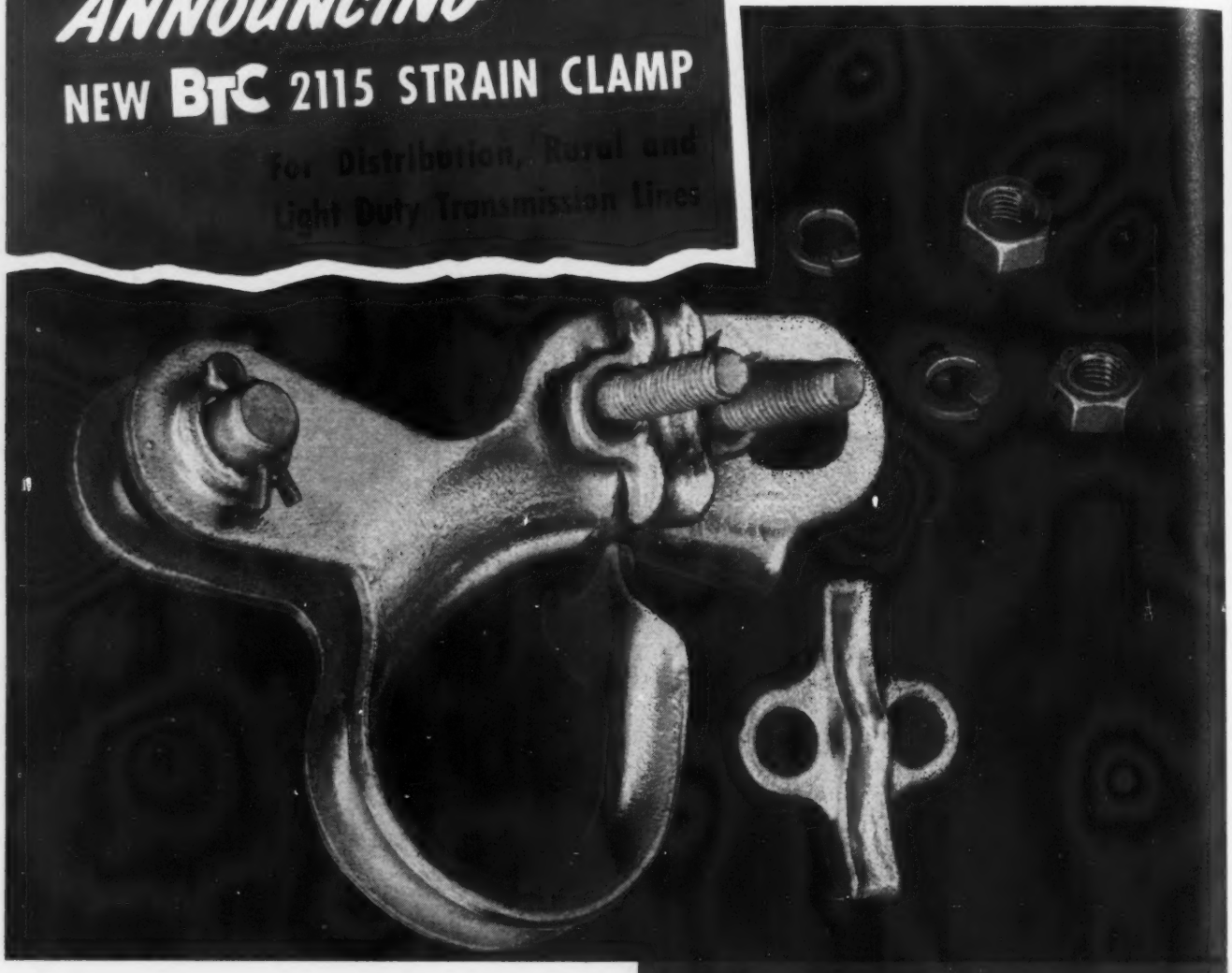
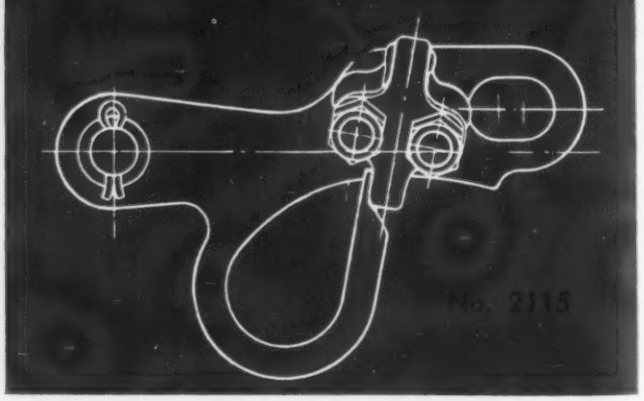
Betty Crocker is a trade name of General Mills

ANNOUNCING
NEW BTC 2115 STRAIN CLAMP
For Distribution, Rural and Light Duty Transmission Lines



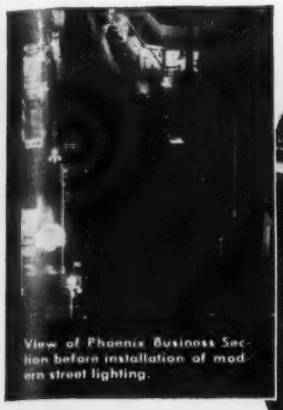


BTC No. 2115 is a new Strain Clamp for use on all *stranded* conductors within its cable size range, *except for* A.C.S.R. which should be installed in the No. 2107 Aluminum Lined Strain Clamp. Cable sizes from Min. 0.187" to Max. 0.4375" can be accommodated. *Not offered* for use on higher strength Galvanized Steel or All-Copperweld Cables generally used as Ground Wires.

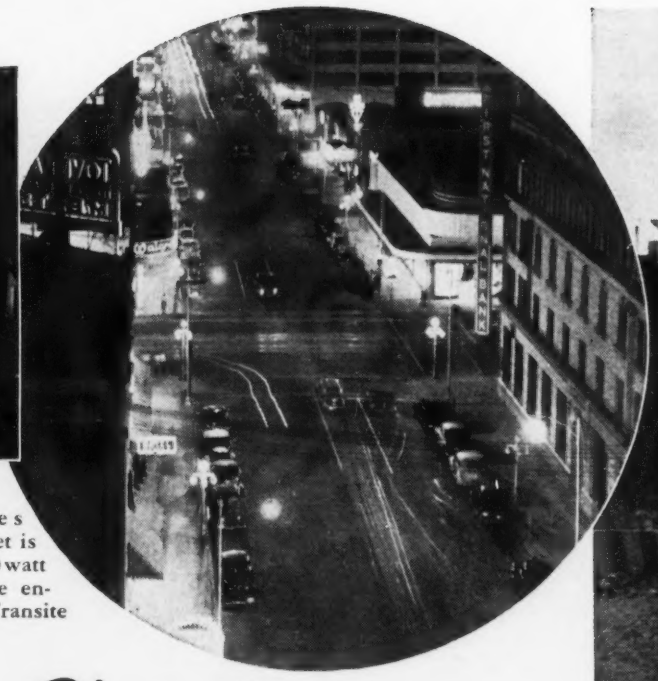
Design of the new BTC No. 2115 Strain Clamp is the familiar Snail-Shell Snubbing Type, but with improved one-piece body pressed from heavy gauge steel without riveted or welded joints. In addition, economy and ease of installation recommend the use of this new BTC No. 2115 Strain Clamp on Distribution, Rural and Light Duty Transmission Lines.

Sold only through your insulator manufacturer

THE BREWER-TITCHENER CORPORATION
CORTLAND, N. Y.



View of Phoenix Business Section before installation of modern street lighting.



Now 14 times brighter, the street is illuminated by 700 watt lamps. Cables are enclosed in J-M Transite Conduit.

Note that the long, lightweight lengths of J-M Transite Conduit are not concreted in, saving time and expense.

When Phoenix made this street brighter

Transite Conduit was used to do the job faster . . . at lower cost

J-M Transite Conduit cuts installation costs because it is lighter in weight—comes in longer lengths—has a smooth bore which makes long cable pulls easy. Also, a complete line of Transite Fittings speeds assembly. All this saves man-hours—results in fast, economical installations.

Yet Transite Conduit is also strong and longer lasting. Built of asbestos-cement, J-M Transite Conduit needs no concreting in to withstand the pressure and vibration of heavy traffic. It does not rot, rust or burn and cannot produce noxious, explosive gases . . . is immune to electrolysis and galvanic action.

Transite Conduit is a rapid heat transmitter, too . . . keeps cables cool, increases system capacity.

Learn all about these advantages by writing for Data Book DS 410, Johns-Manville, Box 290, New York 16, N.Y.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville

TRANSITE DUCTS

CONDUIT for use without concrete

KORDUCT for concreting in

Two Top Industrial Paint Names

★

W. P. Fuller & Co.—founded in 1849

R. N. Nason & Co.—founded in 1860

Combined: 185 years of paint-making experience in the West

FACTORIES: Fuller's paint production facilities now exceed those of **any** combination of other like Western manufacturers. Fuller factories strategically placed in San Francisco (2 plants), Los Angeles and Portland.

LABORATORIES: Fuller now maintains the West's largest staff of paint chemists and technicians; provides them the finest research and control equipment. Laboratories located at San Francisco and Los Angeles.

DISTRIBUTION: Fuller Branches and Warehouses are located in forty-three Western cities—"near everywhere." Fuller gives better sales service to all customers; faster delivery on all products.

EXPERIENCE,

facilities and personnel of W. P. Fuller & Co. and R. N. Nason & Co. combine to give the West outstanding Industrial Finishes

Let Western Industry grow! We are set to serve it!

We've pooled the industrial "know-how" of two pioneer paint makers to form by far the largest paint-making organization in the West.

Advantages to you? Three—definitely!

1. More chemists with more experience bring their knowledge to bear upon each individual finishing problem. 2. The West's largest paint-making facilities assure you the products you need in the quality and quantity you want. 3. Customers get coordinated aid through a sales staff that is laboratory-backed and service-conscious.

Wherever you are in the West, these three big benefits are "at your elbow." Fuller covers the West as no one else can!

TEAM UP-

W. P. FULLER & CO.

Factories at San Francisco, Los Angeles, Portland
Branches and Warehouses throughout the West

Leadership through Research . . . . . .

Industrial Finishes Division

Now—highest quality lacquers, varnishes, stains, fillers, enamels—for wood, wood veneers or plywoods—for metals to be cured by gas, electric oven or infra-red tunnels—for plastics and other production materials.

Now—finishes that give better covering, better "mileage," higher gloss, greater wear.

Now—finishes that observe your production costs yet carry their "coating you love to caress" clear to the sales floor.

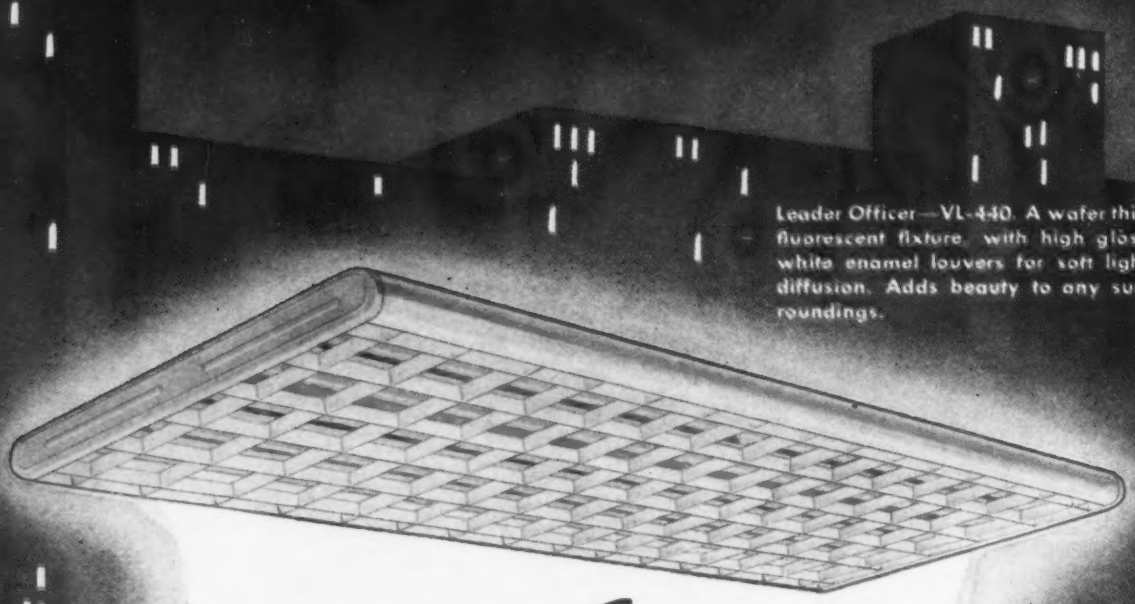
Yes, FULLER – West's largest!

Plant Maintenance Division

There's a Fuller exterior or interior paint for maximum wear, maximum attractiveness on all wood, brick, metal, concrete and stucco building surfaces.

Fuller's new "go-together" *wall colors* beautify offices, lobbies, rest rooms, cafeterias, first-aid wards. Available in three finishes—soft flat, semi-gloss and full gloss!

And get Fuller's *free* plan-book on "Color Engineering." Shows how scientifically used color lowers accident rate, lessens employee fatigue, lifts working morale.

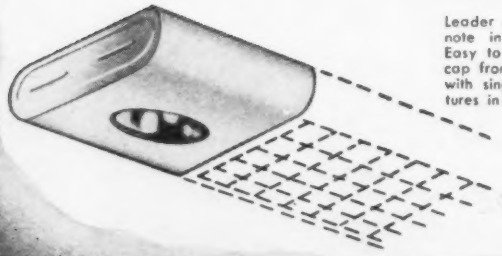


Leader Officer—VL-440. A wafer thin fluorescent fixture, with high gloss white enamel louvers for soft light diffusion. Adds beauty to any surroundings.

modern business chooses the Leader "OFFICER"

Banks, offices, department stores and exclusive shops, airport and railway stations—every type of commercial institution where beauty and better light are important—unanimously choose Leader's modern Officer unit. It's America's most versatile fixture—use it as a single unit or in continuous runs—mount it with stem and canopy or flush with ceilings. For every commercial need, choose the "Officer."

Leader's complete line of fluorescent fixtures is distributed only by better electrical wholesalers. There is a friendly Leader representative in your area.



Leader Adjustable Direclite—A new note in "spotlight" merchandising. Easy to install—simply remove end cap from any "Officer" fixture. Use with single fixture or between fixtures in a series.

LEADER ELECTRIC COMPANY

6127 NORTH BROADWAY • CHICAGO 40, ILLINOIS

WEST COAST FACTORY • 2040 LIVINGSTON STREET • OAKLAND 6, CALIF.

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Utah *

Herbert B. Maw, Governor of Utah, tells his state's story.

"Nature was kind to Utah. Deposited within her borders are rich and varied sources of coal and iron, lead and zinc, copper, silver and gold. These and many other industrial attributes are part and parcel of the undeveloped sections of this state.

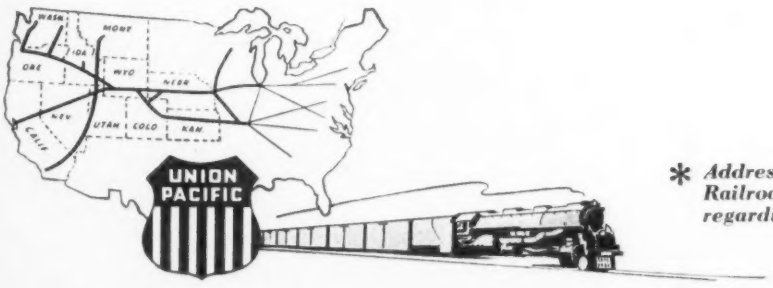
"A gigantic steel industry which can serve the west signals our industrial ambition. It will form the nucleus of a network of associated industries.

"Our need now is people and leadership to share in the prosperity of a western empire. Our natural resources are practically untouched. They assure a long life to an industrial future which is just now beginning. Utah invites new and expanding industry to investigate opportunities here before deciding upon new locations."

★ ★ ★

For industrial resources and opportunities, look to Utah. For unexcelled rail transportation . . .

* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

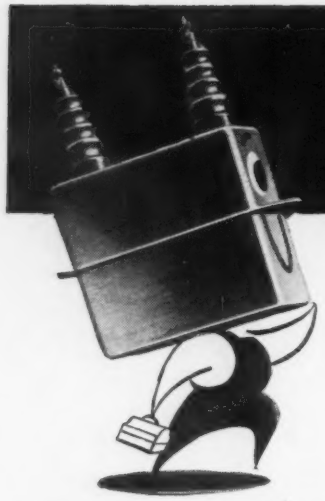


be Specific – say "Union Pacific"

* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE



JOHNNY CAPACITOR'S

8 MILLION KILOVARS OF CAPACITORS CAN'T BE WRONG!

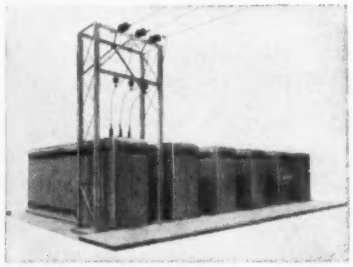
KILOVAR ECONOMICS #1

Johnny says:

"EIGHT million kilovars of capacitors have already been installed in the United States. With system investments in the order of $200 to $500 per kilowatt—and rising—this is the time to reduce your 'blue chip' system investment and, at the same time, obtain valuable additional system capacity by means of capacitors. You can get quick delivery and they can be installed for $10 a kilovar—*or less*!"

The cost of supplying on-the-spot kilovars has gone steadily downward. Today this cost is only 25% of what it was 15 years ago. Contrast this with today's rising costs of other equipment.

By eliminating the transportation of kilovars through your lines, and supplying them at the load by capacitors, additional line and transformer capacity—up to 10% of peak-load requirements or more—is immediately made available.



Such a move can permit postponement of investment in additional generating, transmission, and distribution equipment. There are also many other system benefits to be obtained, such as:

1. ***Reduction of system energy losses and general voltage improvements.***
2. ***Relief on overloads and low-voltage conditions on distribution circuits.***
3. ***Reduction in average cost of purchased power.***

A General Electric specialist will be glad to work with you on the application of capacitors to your system. For further information ask your G-E representative or write to *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

APPLICATION OF CAPACITORS IS FLEXIBLE

Capacitors can be installed either on primary or secondary feeders, as a unit for a locality, or at a specific load center—such as a substation. They can be installed in large units with automatic switching, or as smaller units on distribution circuits for voltage improvement. Their cost is low. Installation does not disrupt operation. They are 100 per cent salvageable in case of changing requirements.

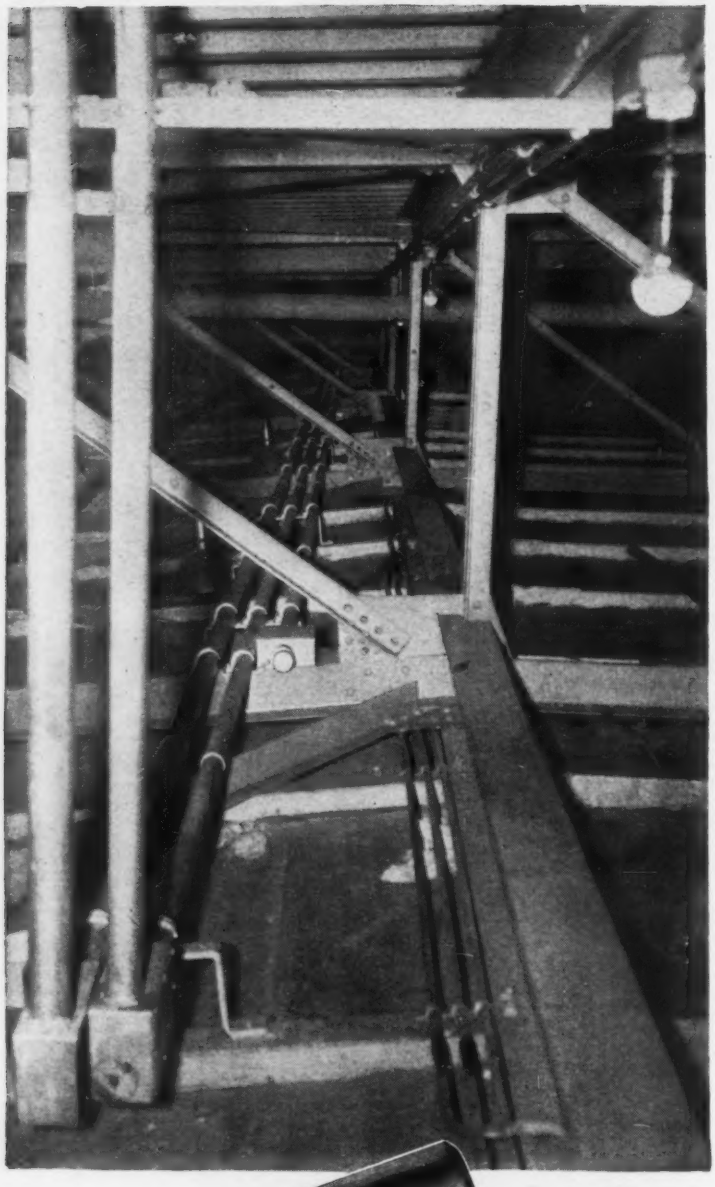
THESE COMPANIES ARE USING CAPACITORS

Typical of the companies now taking advantage of on-the-spot kilovar generation are Oklahoma Gas and Electric Company, with capacitors up to 20 per cent of peak load; Public Service Company of Northern Illinois—10%; Public Service Electric and Gas Company—16%; Illinois Power Company—18%. Why not use capacitors as an economic tool in your system planning?

GENERAL ELECTRIC

407-112-5700

FOR SAFETY'S SAKE . . . USE CONDUIT *(Full Weight Rigid Steel)*



SURE PROTECTION

is cheaper than uncertain hazard

IT may be easy to take a chance --especially if wiring is in out of the way places, if it seems to be safe from careless people and tamperers.

But who can figure the cost of the risk--the risk of dust accumulation, moisture and vapors, vibration, intruding animals, birds, insects, possible explosion?

The only inexpensive fire or explosion is the one that is prevented from happening. It is cheaper in the end to be positively safe, to provide dependable protection for electric wiring--just as has been done in the attic space pictured here--for residence or public building, store or factory.

Youngstown "Buckeye" is a standard-threaded, full-weight rigid steel conduit--most widely used conduit in the world. Rigid steel conduit provides the only kind of wiring system that the National Electrical Code approves for hazardous locations and occupancies as being dust, moisture, vapor and explosion proof. Local distributors have "Buckeye" in stock now.

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

GENERAL OFFICES · YOUNGSTOWN 1, OHIO

Export Offices - 500 Fifth Avenue, New York City

Manufacturers of

CARBON · ALLOY AND YOLOY STEELS

Ask your distributor for:
Youngstown Buckeye Conduit...Pipe and Tubular Products...Sheets...Plates...Electrolytic Tin Plate...Coke Tin Plate...Bars...Rods...Wire...Tie Plates and Spikes.

ull Electrical Protection
ESPITE WIND-DRIVEN SAND, NOW, SLEET AND RAIN!

New "UNITOP" Breaker is typical of the high standards of engineering, craftsmanship and materials that go into *All* Allis-Chalmers Circuit Breakers!

PLANNING ALLIS-CHALMERS power circuit breakers for your system is a sound policy for the *future* — because these breakers return you maximum dividends for every dollar you invest!

They offer you *practical* benefits of extensive laboratory-engineering research, plus nation-wide acceptance . . . and are backed by almost half-a-century of experience in the manufacture of breakers.

Look for these *leadership-building* qualities next time you consider circuit breakers for your system. *All* are had in the Allis-Chalmers line:

- RELIABLE, HIGH-SPEED PERFORMANCE — that assures highest continuity of service . . . top protection for system and equipment.
- QUICK, EASY INSPECTION — With tanks quickly lowered, all contacts and mechanism are readily accessible for fast, thorough check.
- HIGH INSULATION LEVEL — Corona-free, long-life bushings are designed to meet severe system voltage conditions.
- LONG-LIFE—Simple, rugged design plus high-grade workmanship and materials.
- LOW MAINTENANCE — that helps you save time, money.

An Allis-Chalmers representative will be glad to discuss your needs with you. Call your nearby A-C office, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2201

TYPE FZO-150 designates an up-to-date line of Allis-Chalmers high voltage, quick-clearing, outdoor, frame-mounted oil circuit breakers. Standard ratings from 15 to 46 kv — 500,000 to 1,000,000 kva interrupting capacity.

Equipped with "Ruptor" high-speed interrupting device that greatly reduces arc energy release, contact burning, oil deterioration and tank pressures, these breakers offer you additional advantages as:

NEW "UNITOP" SINGLE TOP FRAME — combines rigidity with smooth appearance.

ELIMINATION OF EXTERNAL CONDUITS — wiring, etc. enclosed in sealed ducts.

GAS AND OIL SEALS between poles, maintaining isolation advantages of top-per-pole frame construction.

WIDE-BASE OIL TANKS — set firmly.

Complete details in new Bulletin 71B6421. We'd be pleased to send you a copy.

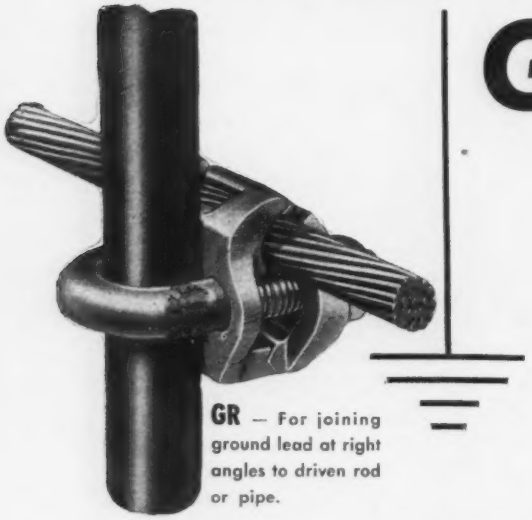
ALLIS-CHALMERS

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

BURNDY

connectors for GROUNDING

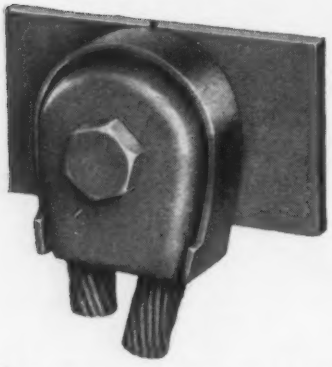


GR — For joining ground lead at right angles to driven rod or pipe.

Burndy ground connectors are available for use on driven rod, pipe, tower legs, fence posts, oil storage tanks, transformers, breakers, etc. These sturdy mechanically strong ground connectors are made from high copper content, corrosion resistant alloys. Specify "Burndy" for your important groundings. Write for details.

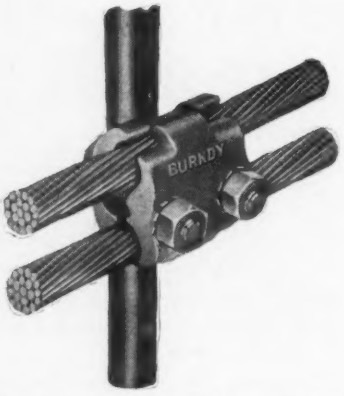
BURNDY — New York 54, N. Y.

In Canada: **Canadian Line Materials Ltd., Toronto 13**
Foreign: **Philips Export Corporation, New York 17**
WESTERN BRANCH • VERNON, CALIFORNIA

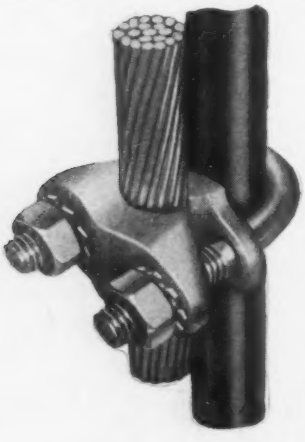


GZ — For joining grounding wire or cable to flat bar, tower legs, etc.

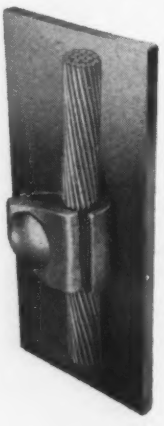
GG — For joining flat braid or bar to switch operating pipe handle or fence post.



GP — For joining two ground conductors at right angles to driven rod or pipe.



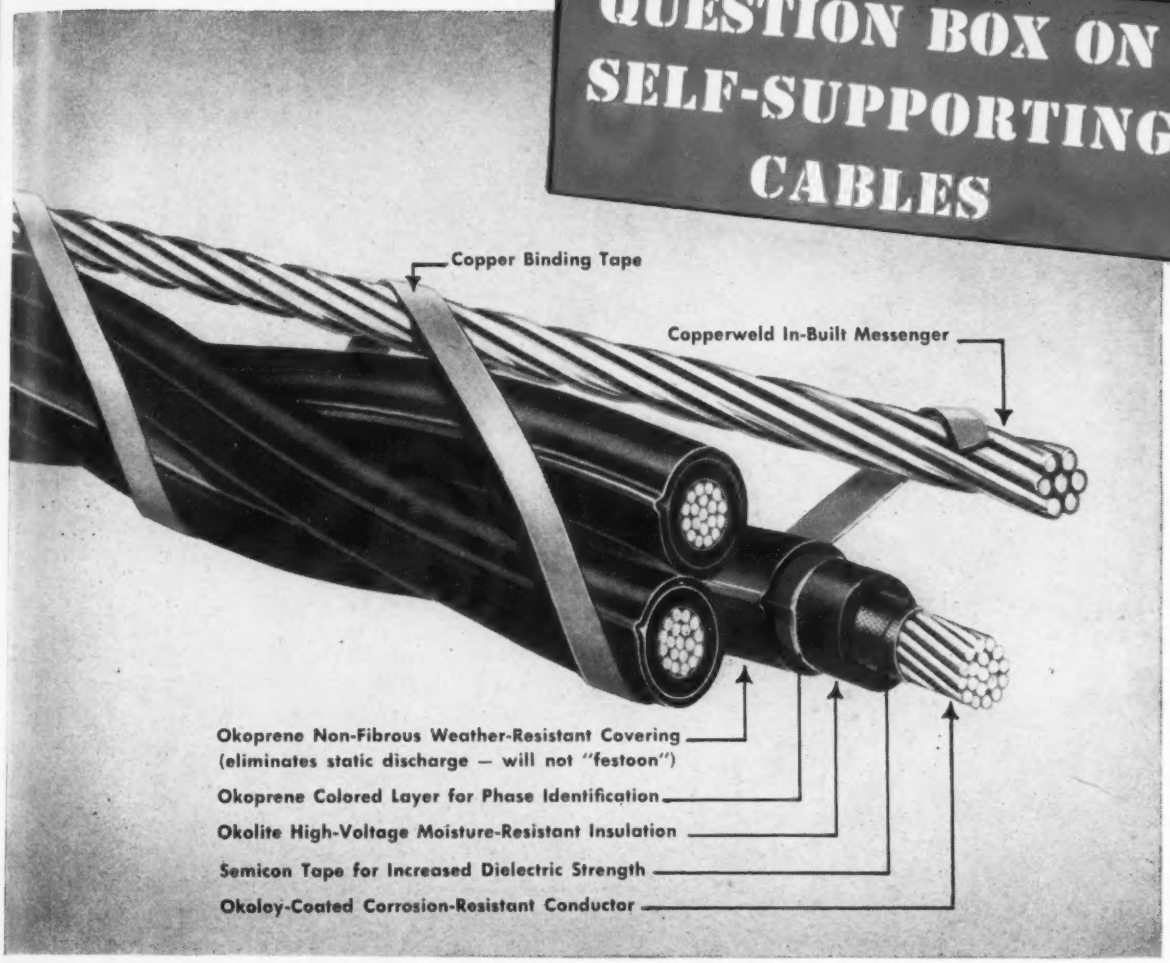
GA — For joining ground lead parallel to driven rod or pipe.



GB — For joining ground lead to flat bar or angle iron.

GX — For joining two crossing ground conductors.

QUESTION BOX ON SELF-SUPPORTING CABLES


Copper Binding Tape
Copperweld In-Built Messenger
Okoprene Non-Fibrous Weather-Resistant Covering
(eliminates static discharge — will not "festoon")
Okoprene Colored Layer for Phase Identification
Okolite High-Voltage Moisture-Resistant Insulation
Semicon Tape for Increased Dielectric Strength
Okoloy-Coated Corrosion-Resistant Conductor

QUESTION: What does "Self-Supporting" mean when applied to aerial cable?

ANSWER: It is an insulated power cable design that includes a messenger wire as an integral part of the assembly. It may contain one or more insulated conductors.

QUESTION: What *improvements in service* are gained through the use of such a cable?

ANSWER: It is designed to supplant open-wire construction by providing a fully-insulated cable that eliminates tree-trimming, reduces service interruptions, improves current regulation, cuts down pole congestion and reduces the clearances normally needed near structures.

QUESTION: What are some of the *economies* of Okolite-Okoprene Self-Supporting Aerial Cable?

ANSWER: It can be installed in a *single operation* requiring no separate stringing of messenger or placing of rings, it permits long spans, doesn't need overlength poles to clear tree tops, can operate in storms and even when poles are down.

QUESTION: What are some of the *unique features* of Okolite-Okoprene Self-Supporting Aerial Cables?

ANSWER: It does not require a lead sheath yet is permanently weather-protected with its Okoprene covering; it can be spliced by any lineman, does not require shielding up to 5000 volts and, when furnished with "Dualay" assembly is the *only self-supporting cable that can be tapped hot.*

QUESTION: How can I find out more about Okolite-Okoprene Self-Supporting Aerial Cable and its relation to my own distribution problems?

ANSWER: (1) By talking with Okonite engineers or (2) sending for the new 52-page manual on Self-Supporting Cable which contains complete engineering information, charts, tables, photographs, diagrams. Just ask for Bulletin OK-1033 when writing to The Okonite Company, Passaic, N. J.

4967

Round Coils...

...their advantages in distribution transformers and why they are used in L-M Round-Wound Transformers

L-M Round-Wound Transformers have round coils on a wound core. They are made in sizes from 1½ to 25 kva, in all distribution class voltages including 14,400 volts. They meet all EEI-NEMA standards.

In addition to the advantages inherent in round coils, L-M Round-Wound construction provides many advantages, such as improved ratio of losses, low exciting current, good regulation, economical operation, low maintenance and long life. If you are not familiar with its many advantages, it will pay you to investigate, to see why so many companies have standardized on L-M Round-Wound distribution transformers.

Round coils have certain marked advantages for distribution transformers. Line Material is outstanding for its development of an economical and efficient method for using round coils on smaller transformers. This method is L-M Round-Wound construction.

Round-Wound construction is an exclusive L-M method of winding round coils directly onto a wound core. It is used on transformers from 1½ to 25 kva.

Round Coils Provide:

High average impulse strength. In winding round coils, insulation is uniformly distributed, and the coil is wound tightly and evenly, in its final shape; there is no need for malleting into shape with consequent danger of damage to insulation.

High short-time overload capacity. Round coils used in core type construction provide more cooling surface; there is less danger of "hot spots" under heavy loads.

Low reactance, giving better regulation at all power factors.

Longer transformer life. Under short-circuit currents, rectangular coils tend to assume a round shape; the forces may be violent enough to cause total failure. But since round coils are already round, short-circuit currents can produce very little distortion in them.

Write for Bulletin 16-G-1

This new Transformer Bulletin gives details on construction, specifications, accessories, tap changers, hangers, etc. Write Line Material Company, Transformer Division, Zanesville, Ohio.

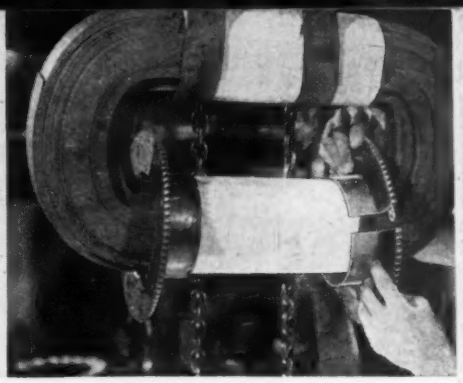
LINE MATERIAL
TRANSFORMERS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors

How We Wind the Round Coils onto the Core

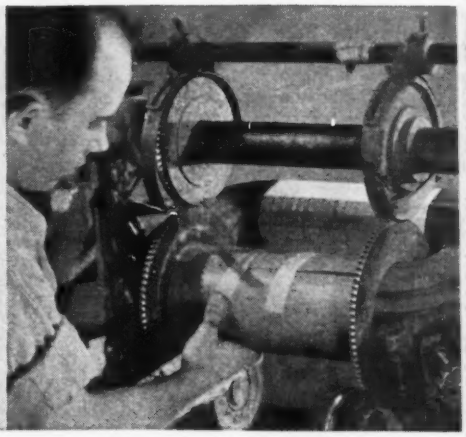
1

Split winding gears are placed around the taped core leg. These gears are rotated by driving gears on the winding machine. (Winding gears are removed after the coil winding is completed.)



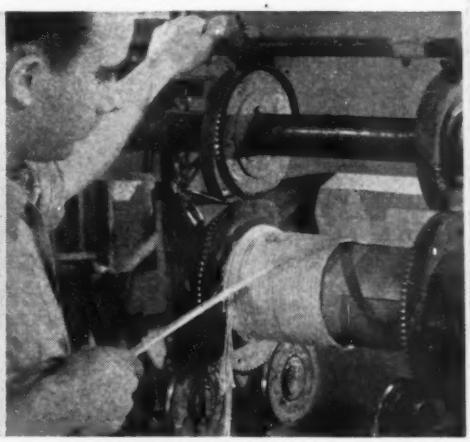
2

First a tube of insulating paper is wound onto the flanges of the winding gears. This tube becomes part of the finished coil. Round coils are wound on this tube as it is rotated by the winding gears.



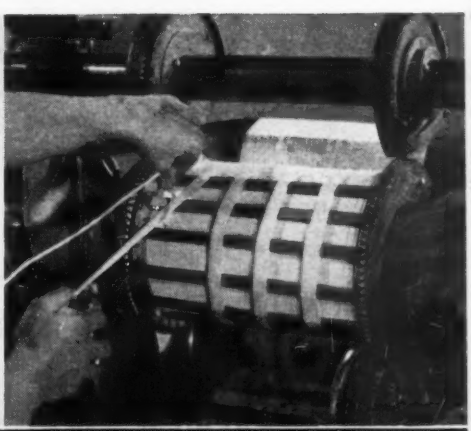
3

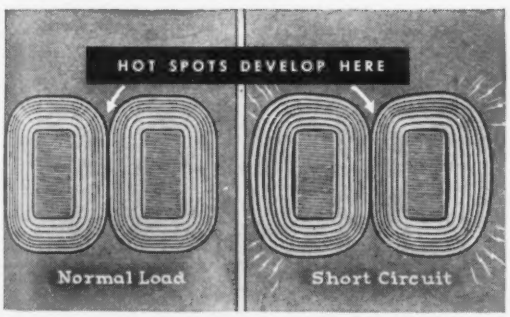
This simple method of winding assures even tension, and tight coils, which utilize the maximum value of the insulation without danger of damage from subsequent hammering into a different shape.



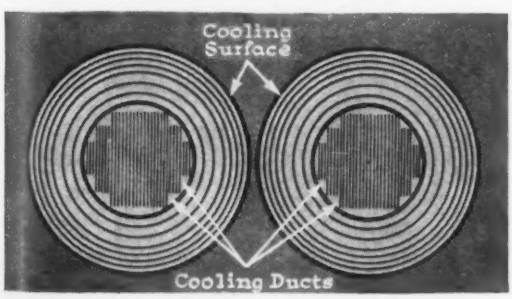
4

In the larger sizes of L-M Round-Wound Transformers, oil duct spacers are wound into the coils, to provide passages for additional cooling oil circulation, assuring freedom from hot spots.





Hot spots develop where the flow of cooling oil is restricted. Also, rectangular coils tend to distort to a round shape under short circuit currents.



Round coils present maximum cooling surface to the oil. In addition, the stepped cross section of the core forms generous cooling ducts through the heart of the assembly. Also, since coils are already *round*, short circuit currents produce very little distortion.

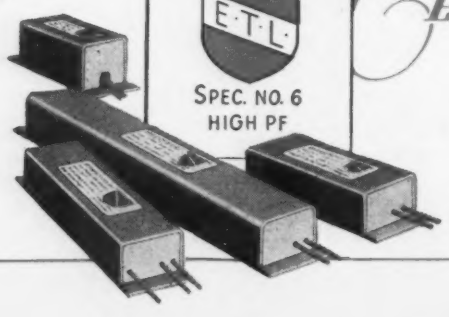
LM

LINE MATERIAL
TRANSFORMERS

L-M DISTRIBUTION EQUIPMENT INCLUDES: Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • Wired Radio Control Equipment • Capacitors

"... and the thing you don't see makes the big difference in fluorescent lighting!"

We're talking about auxiliary equipment . . . the BALLASTS that are responsible for satisfactory performance and dependable operation of fluorescent lamps and fixtures. Ballasts are the *heart* of the fixture—and using the *right* ballasts makes a whale of a difference! The answer is simple: CERTIFIED BALLASTS, built to rigid specifications, tested, checked . . . and CERTIFIED by famous Electrical Testing Laboratories, Inc., as to compliance with those specifications. That's why the familiar ETL Certified Label on ballasts is all-important.



CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting Fixtures

Acme Electric Corporation
Cuba, New York

Chicago Transformer Div.
Essex Wire Corporation
3501 Addison St., Chicago, Illinois

General Electric Co.
Specialty Transformer Division
Fort Wayne, Ind.

Jefferson Electric Co.
Bellwood, Illinois

Sola Electric Co.
2525 Clybourn Avenue
Chicago 14, Illinois

Starring and Company
Bridgeport, Conn.

Wheeler Insulated Wire Co., 378 Washington Ave., Bridgeport, Conn.

Simplex adds Neoprene Jackets to Anhydrex Underground Cables

A NEW JACKET of tough neoprene now protects all ANHYDREX Underground Cables. Its many outstanding features, combined with those of the Anhydrex insulation, make these improved cables ideal for service in both underground and open-air circuits.

SIMPLEX ANHYDREX INSULATION ▶

- Has excellent electrical properties; High dieletric strength, low power factor, low specific inductive capacity.
- Effectively resists moisture. It has greater moisture-resistance than any other rubber insulation on the market today.
- Has excellent aging qualities.

◀ SIMPLEX NEOPRENE JACKET

- Cannot rust or rot.
- Requires no duct lubricants.
- Will not "freeze" to ducts.
- Resists soil acids and oils.
- Is not subject to electrolysis.
- Is flame and abrasion resistant.
- Is immune to sun-checks and cracks.
- Is more flexible than metallic sheaths.

Recommended for series street lighting, service entrance, and power transmission. Easy to tap, joint, and terminate.

May be installed with or without ducts.

Simplex

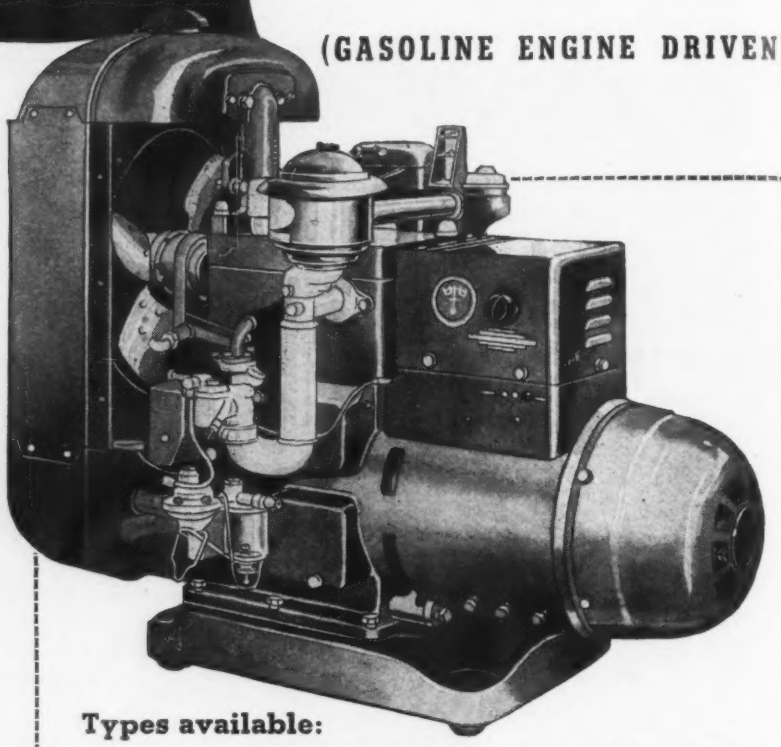
WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.

Everything Electrified with

PORTABLE ★ GENERATORS

(GASOLINE ENGINE DRIVEN)



Low WAA prices make these sturdy, all-purpose portable electric power units practical for use on jobs which have never before justified expensive equipment. Today these generator sets, designed and built for heavy duty work, are for the first time cheap enough to use for unusual jobs in out of the way places. Decide now where you can use one or more—and act immediately to take full advantage of these remarkable prices.

☆ ☆ ☆

Larger sizes can be adapted for use of natural gas fuel, other sizes are valuable for:

Stand-by Units	**Summer Camps**
Small Machine Shops	**Trailer Camps**
Saw Mills	**Carnivals and Fairs**
Radio Stations	**Mobile Power Units**
Rural and Farm Installations	**Construction Jobs**

☆ ☆ ☆

See our display booth at the Western Metal Exposition and Congress Show at Oakland, California, March 22 to 27, 1947

Types available:

ALTERNATING CURRENT: 60 cycles, single and three phase, 120-480 volts, 1½ kva. and up, priced from $250 up.

DIRECT CURRENT: 24, 110, 220 volts, ¼ to 40 KW, priced from $80 up.

All generators are sold under existing priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the materials offered herein.

EXPORTERS: Your business is solicited. If sales are conducted at various levels you will be considered as a wholesaler. Any inquiries regarding export control should be referred to Office of International Trade, Department of Commerce, Washington, D. C.

OFFICE OF GENERAL DISPOSAL

★ **WAR ASSETS ADMINISTRATION**

GOVERNMENT WAA SURPLUS

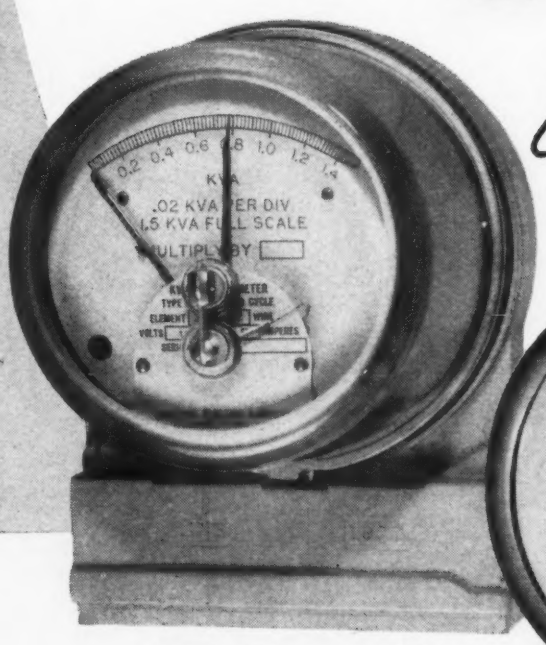
Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cincinnati • Cleveland Dallas • Denver • Detroit • Fort Worth • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • New York • Omaha • Philadelphia Portland, Ore. • Richmond • Salt Lake City • St. Louis • San Antonio • San Francisco • Seattle • Spokane • Tulsa

824-2

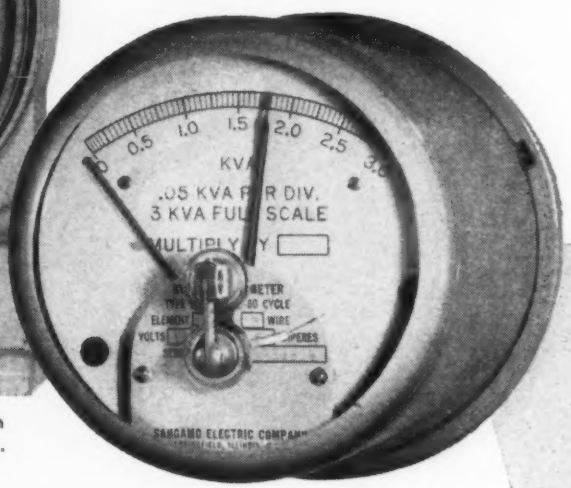
measured demand

for

KVA BILLING ON INDUCTIVE LOADS



TYPE VAP, with conventional bottom connected polyphase base.



Type VAS, for socket mounting.

KVA measurement gives in a single quantity an effective basis for billing on inductive loads, because on this basis fixed charges are recovered on the two items of investment cost: (1), Kilowatt capacity, and (2), necessary additional equipment to supply or to correct for the losses of RKVA.

With the measurement of KVA, demand billing to include the incremental costs of additional facilities to serve inductive loads, may be simplified. Demand rates can be stated for a single quantity—complicated power factor clauses may be omitted from the rate schedules.

Sangamo Lincoln Type VA Thermal Demand Meters, employing the phase shifting transformer principle, provide a simplified and low cost means for the measurement of KVA on polyphase circuits.

SANGAMO ELECTRIC COMPANY
SPRINGFIELD • ILLINOIS

There's a CHANCE

(FORMERLY KNOWN AS "TIPS")

Grounding Set

for every Overhead and Substation Requirement

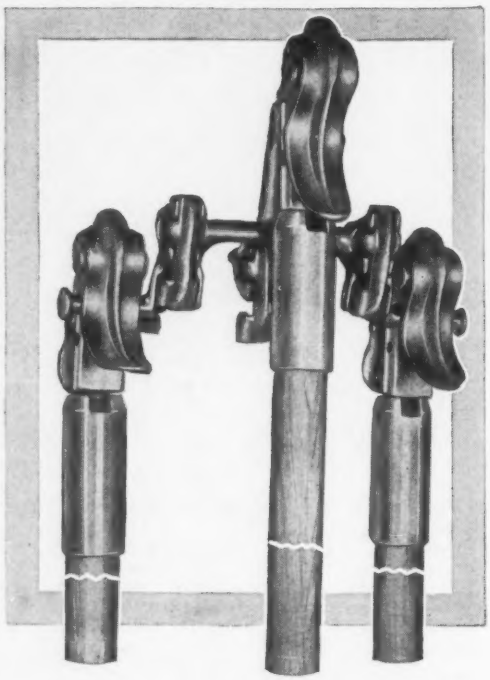
Dependable Protection on all types of jobs—For Single-phase Lines up to Heavy Substation Bus Bars

For ample protection to linemen making repairs on "cold" lines, Grounding Equipment should make tight contacts at all points—maintain high conductivity and provide insulation protection during application. You get all this in every type and size and a few plus features, when you specify Chance Grounding Equipment.

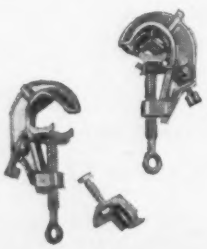
Single clamps or combination sets are available for all types of highline or substation work with mechanical and electrical characteristics to meet every requirement. Clamps or clusters of clamps may be obtained, either mounted on poles or unmounted, for application with clamp sticks. This equipment is designed by experts and thoroughly tested to provide the protection that your linemen should have against unexpected current surges.

The clamps snap on with minimum arcing and screw up tight on the conductor by turning the poles or eye screws. Jumper pressure contacts are pre-tightened with a wrench. There are no loose contacts as when hazardous grounding chain is used. All parts are carefully tested to meet high Safety Standards. All poles are laminated for strength and tested to resist 75,000 volts per foot.

Complete details on Chance Grounding Equipment will be found in the grounding section of your Hot Line Tool Catalog No. 8.



Mounted Grounding Sets like the above give definite protection to linemen as they eliminate the danger of clamps being applied by hand. All sets are available with cable attached.



Substation Bus Bar Clamps and combination sets are made in varied types and sizes for flat or round bus bars. The eye screw clamps at right have removable bronze inserts that make them adjustable to fit a number of different sized bus bars. These, too, are available either mounted or unmounted.

C471

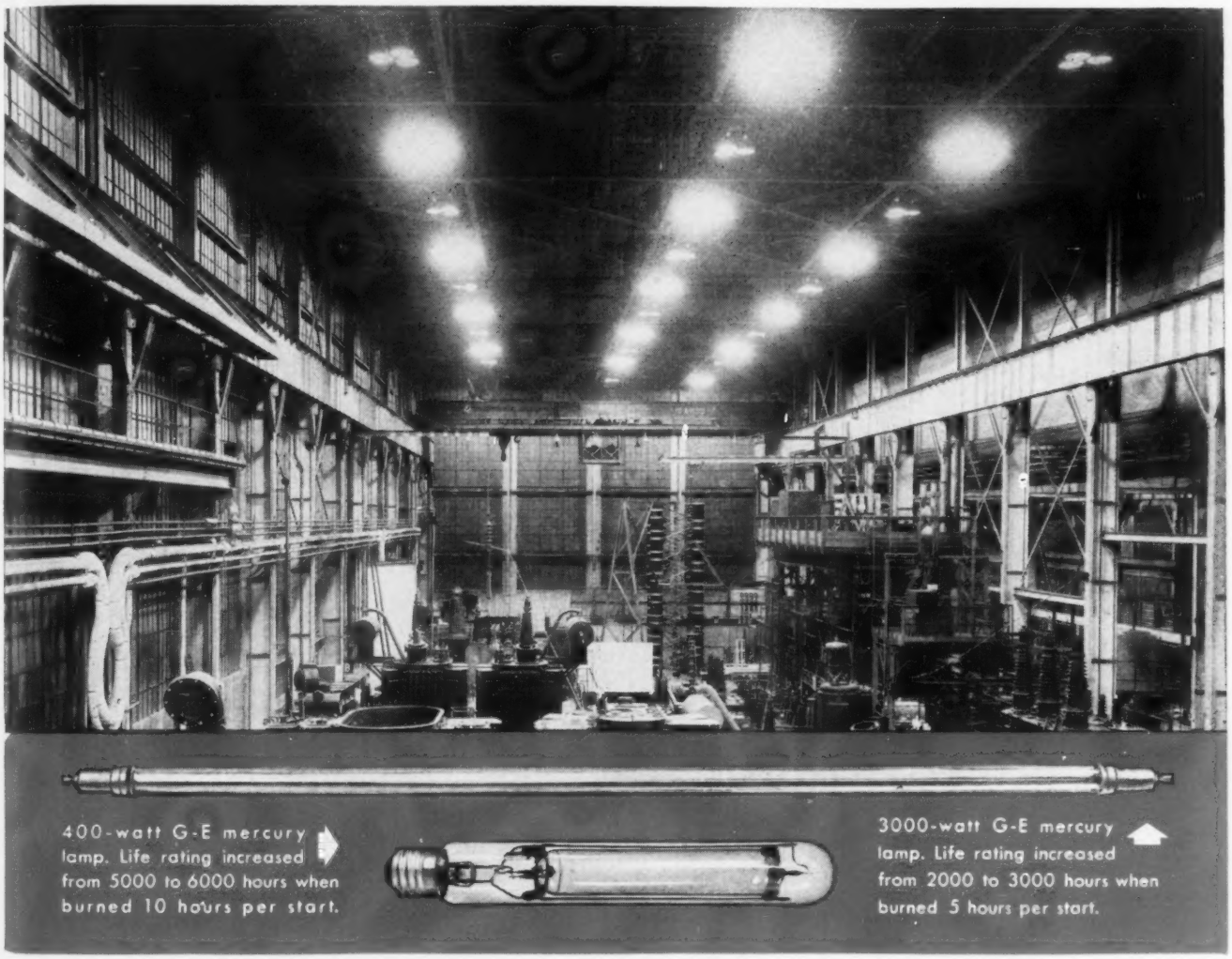
ABC INDUSTRIES

A·B·CHANCE CO·

CENTRALIA, MISSOURI.

SAN FRANCISCO, CALIFORNIA

In this large assembly shop, 3000-watt mercury units are combined with three 1000-watt filament lamps to approximate daylight.



400-watt G-E mercury lamp. Life rating increased from 5000 to 6000 hours when burned 10 hours per start.

3000-watt G-E mercury lamp. Life rating increased from 2000 to 3000 hours when burned 5 hours per start.

Now . . . 1000 Hours more life for G-E Mercury Lamps!

Now even greater improvements in industrial lighting are possible with General Electric mercury lamps. The 1000-hour increase in life ratings for both the 400-watt and 3000-watt lamps means a corresponding reduction in lamp renewal costs, with the same dependable illumination.

As you plan new industrial lighting jobs—especially those with high mounting in assembly shops, steel mills, foundries, etc.—be sure to make the most of these G-E mercury lamp advantages:

1. **HIGH EFFICIENCY**—Initial light output 40 lumens per lamp watt.
2. **SUSTAINED LIGHT OUTPUT**—Still 35 lumens per lamp watt at 70% of rated life.
3. **LOW MAINTENANCE COST**—High light output per lamp means fewer fixtures to service.
4. **LONG LIFE**—Up to 6000 hours rated life, depending upon wattage and number of starts.

Remember—*whatever lamps you need, G-E makes 'em all!* So you can always count on your nearby General Electric Lamp office as a reliable and unbiased source of information when it comes to lamp selection. General Electric Company, Lamp Department, Nela Park, Cleveland 12, Ohio.

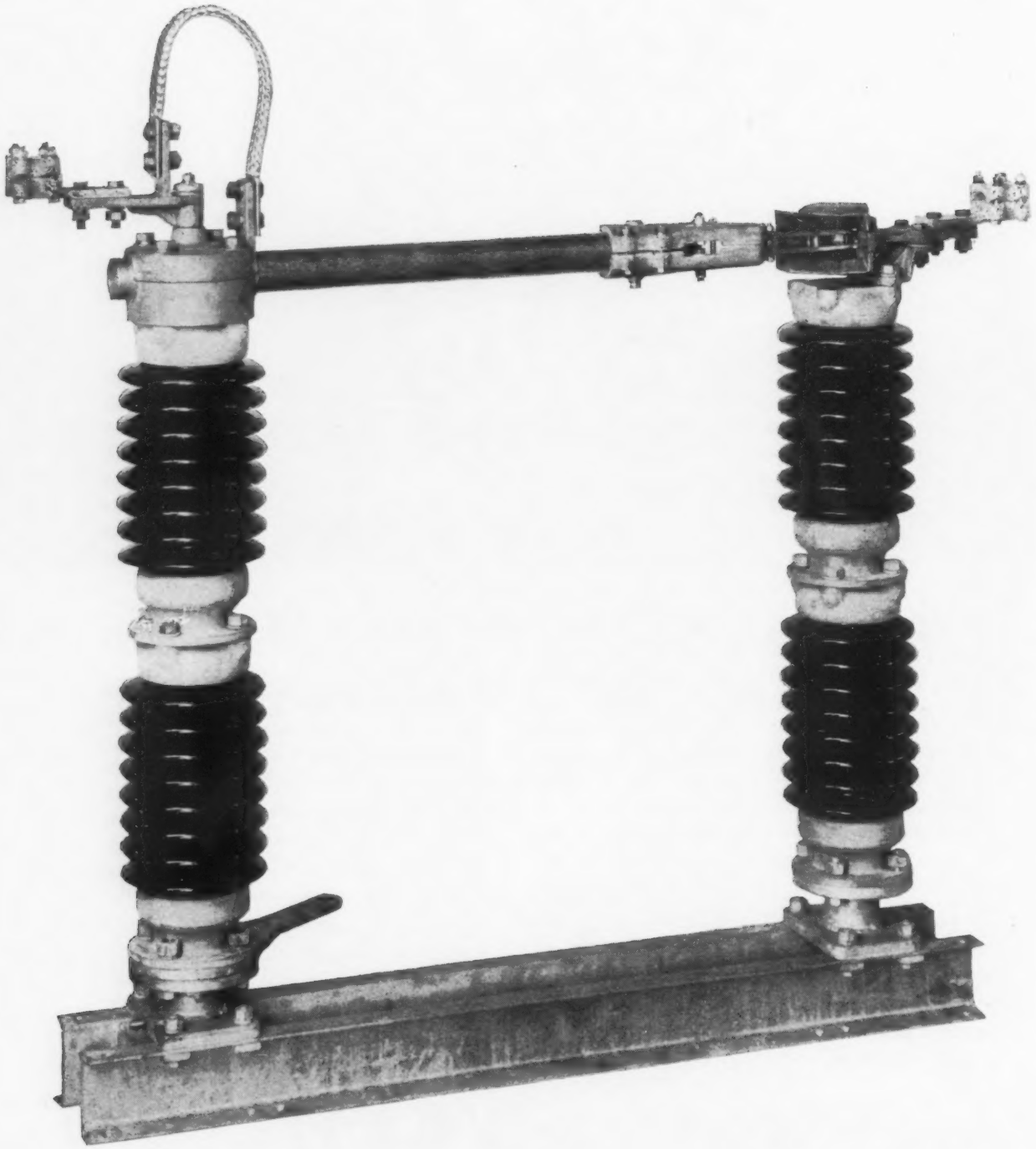
G-E LAMPS

GENERAL ELECTRIC

Cole Electric Co.

1510 So. Los Angeles St. Los Angeles (15), Calif.

PRospect 2068

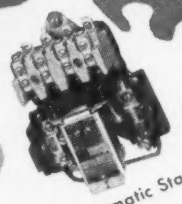


AIRBREAK DISCONNECTING SWITCH
69,000 Volts—600 Amperes, Type LU, T.P.S.T. Horizontal break, Group Operated (One pole shown)
For upright, vertical or underhung mounting

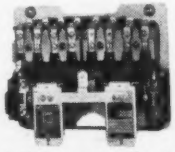
SQUARE D's *Complete* LINE OF DEVICES...

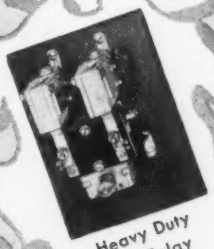
fits into practically any Motor Control Picture

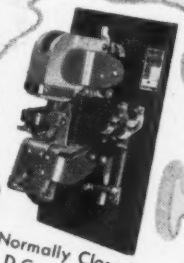
...A.C. and/or D.C.

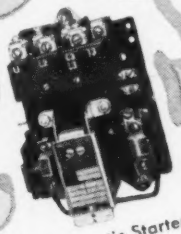

A.C. Automatic Starter

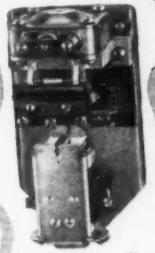
D.C. Contactor


A.C. Reversing Starter

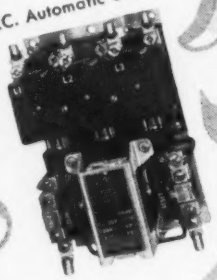

Heavy Duty D.C. Relay

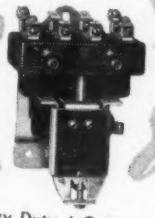

Normally Closed D.C. Contactor

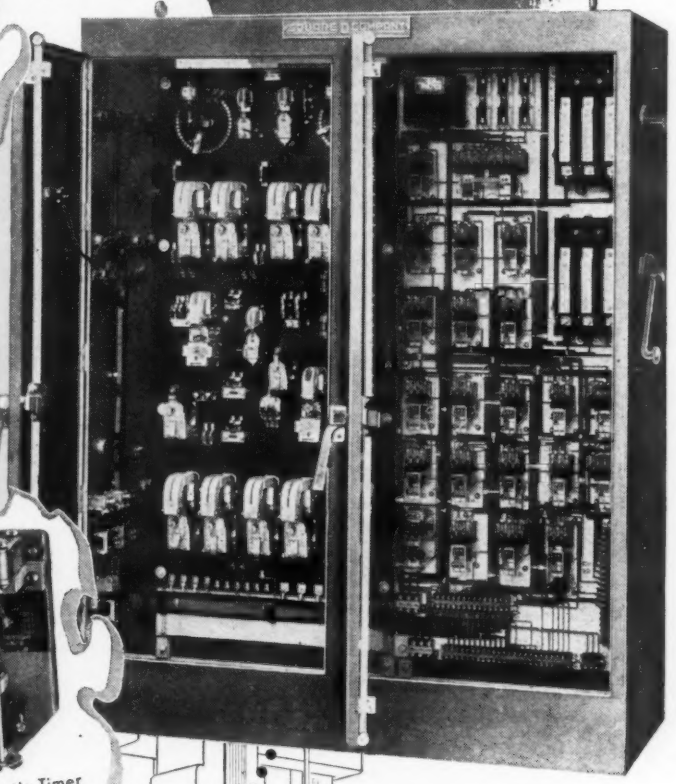

A.C. Automatic Starter

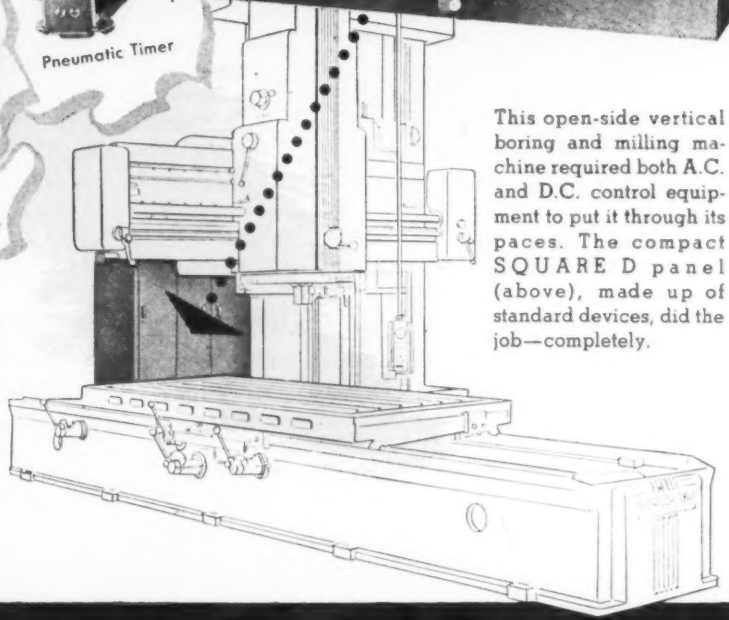

Pneumatic Timer

A.C. Automatic Starter




Heavy Duty A.C. Relay



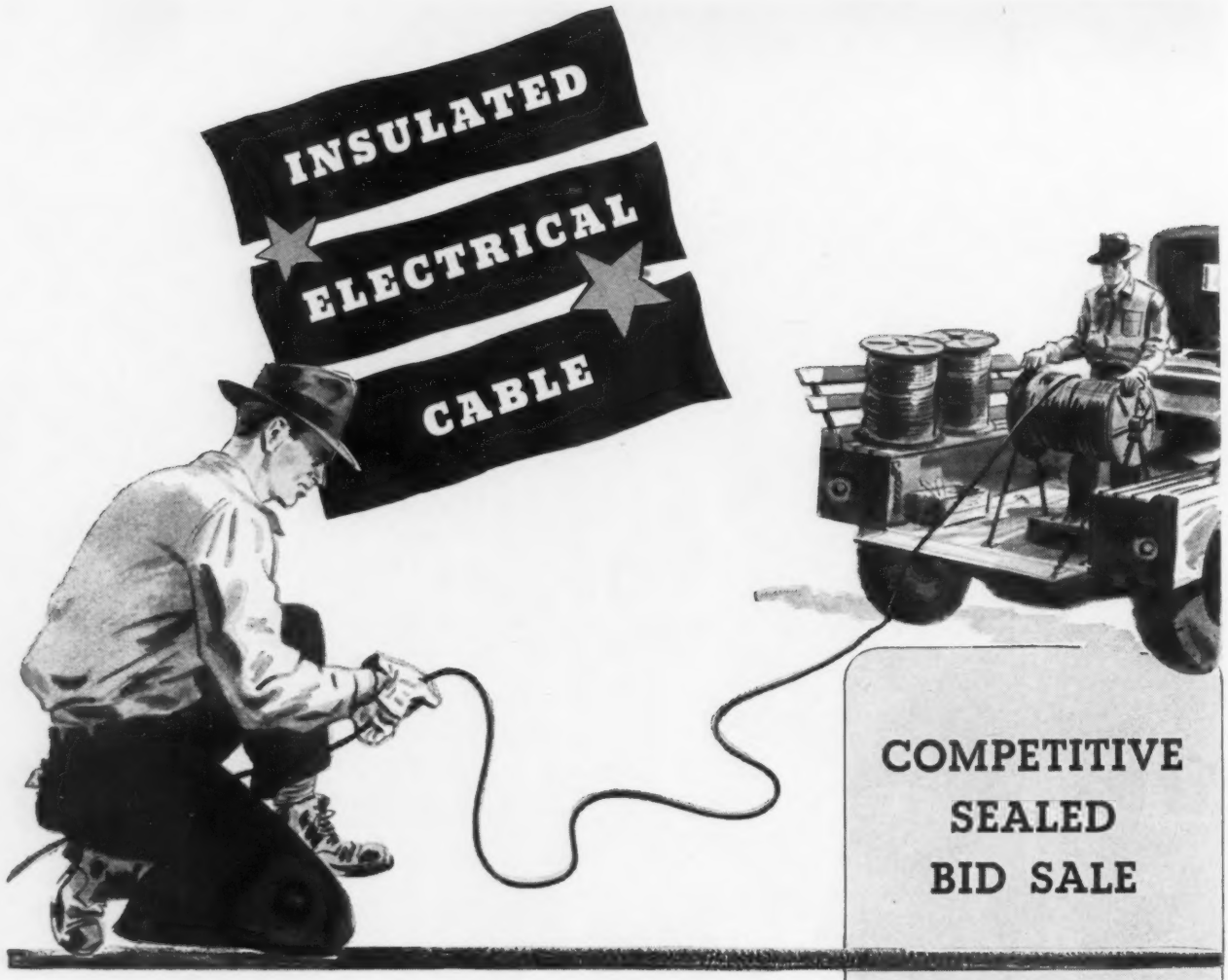


This open-side vertical boring and milling machine required both A.C. and D.C. control equipment to put it through its paces. The compact SQUARE D panel (above), made up of standard devices, did the job—completely.

• SQUARE D's line of D.C. control matches its A.C. line in both completeness and performance. Thus, either standard or special control requirements—A.C. or D.C. or a combination of both—are easily met.

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES



COMPETITIVE SEALED BID SALE

Miles and miles of this rugged, *unused* wire and cable offer money-making opportunities to alert commercial buyers and exporters . . . and these buyers "name their own prices" in this easy-to-buy, sealed bid sale. Large quantities of this valuable material, conveniently packed in coils or on reels, are held by New Orleans, New York, Los Angeles, San Francisco and other War Assets Administration Regional Offices shown below. Your inspection of this material is invited. Address your inquiries directly to the Regional Offices listed below.

U. S. NAVY and MARITIME WIRE and CABLE offered in this sale feature:

Rubber and synthetic insulations	1,630 to 2,000,000 circular mils
Voltage rating of 300 to 600	One to forty-four conductors
Basket weave armors	Identifying braids
Varnish cambric	Rubber jackets
Asbestos braids	Cotton braids
Plastic sheaths	Lead sheaths

☆ ☆ ☆

OFFICE OF GENERAL DISPOSAL

WAR ASSETS ADMINISTRATION

Birmingham • Boston • Chicago • Cleveland • Detroit • Houston • Jacksonville
Los Angeles • Louisville • Minneapolis • New Orleans • New York • Portland
Richmond • St. Louis • Salt Lake City • San Francisco • Seattle • Spokane

1025

HOW TO BUY:

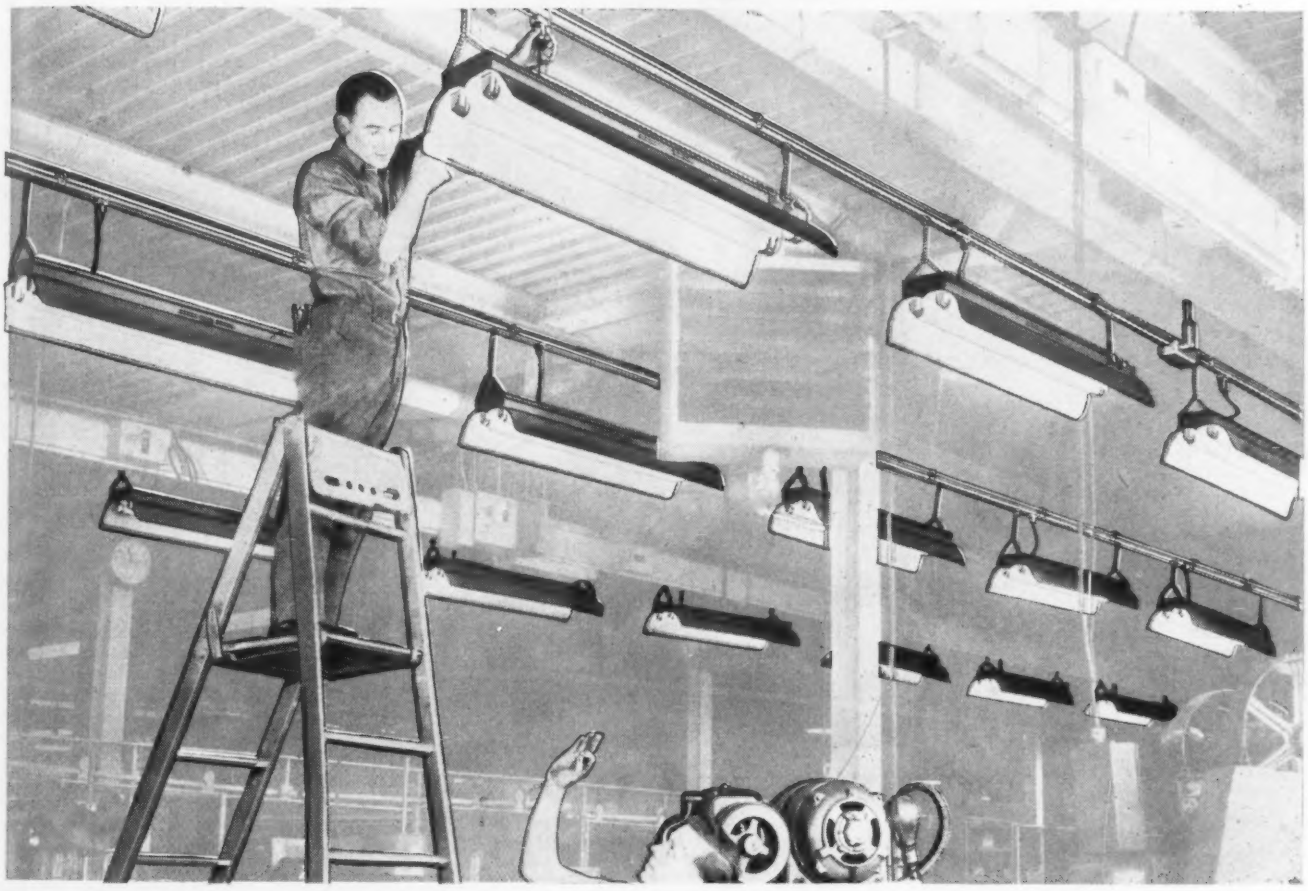
Valuable equipment and materials, such as this U. S. Navy and Maritime Wire and Cable, are constantly being offered by all of the Regional Offices listed below. Sales are conducted on both competitive sealed bid and fixed price basis. Dates of sales—and conditions governing all transactions—will be sent to you upon request. Request should be made directly to Regional Offices. To keep completely informed on commodities inventories, minimum and maximum purchases, dates of sales, etc., of each Regional Office, requests should be made to be placed on the mailing lists of each and every Regional Office which could serve your needs.

☆ ☆ ☆

EXPORTERS:

Your business is solicited. Exporters are considered as wholesalers in the purchase of surplus property. Any questions on export control should be referred to Office of International Trade, Department of Commerce, Washington 25, D. C.

How to lighten your cost for light



LET'S throw some light on the cost of lighting with old-style wiring systems.

First of all, moving a fixture means a re-wiring job, including the installation of a new fixed outlet. That costs money. So does the production shutdown when power is cut off to tap in the new fixture. And finally, the materials torn out to make the change generally wind up in the scrap heap—a total loss.

And suppose you *do* compute these expenses and decide to make the old set-up suffice. Then production takes it on the chin, because any kind of precision work calls for highly efficient illumination.

So why not lighten your cost for light with BullDog Universal Trol-E-Duct? This modern, efficient, completely flexible system of electrical distribution puts current wherever you want it—any time you want it—within a few minutes.

BullDog Universal Trol-E-Duct serves lighting fixtures of any type, and small portable tools, as well. It's geared to the demands of today and tomorrow. Twist-out plugs or trolleys can be inserted to tap power from totally-enclosed bus bars at any point in the continuous slotted duct.

And for the "clincher," Universal Trol-E-Duct is built in standardized, pre-fabricated sections for easy dismantling and reinstallation when your plans call for radical shifts on production lines. You won't scrap so much as one bolt in the transfer, either.

There's a BullDog Field Engineer nearby who can show you the advantages of Universal Trol-E-Duct in an installation near your own plant. See him soon. Or, simply write BullDog direct and we'll send descriptive folders.

ADEQUATE WIRING SERVES AND SAVES

BULLDOG

ELECTRIC PRODUCTS COMPANY

BullDog manufactures Vacu-Break Safety Switches—SafToFuse Panelboards—Superba and Rocker Type Lighting Panels—Switchboards—Circuit Master Breakers—"Lo-X" Feeder BUStribution DUCT—"Plug-in" Type BUStribution DUCT—Universal Trol-E-Duct for flexible lighting—Industrial Trol-E-Duct for portable tools, cranes, hoists.

Detroit 32, Michigan. Field Offices in All Principal Cities. In Canada: BullDog Electric Products of Canada, Limited, Toronto

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

Coast Electric & Manufacturing Co.
1720 N. E. Sixth Avenue Tel. Garfield 2844
Portland, Oregon

Safety Switchboard Company
1445 Stevenson St. Tel. Hemlock 2470
San Francisco, Calif.

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel. Jefferson 2224
Los Angeles, Calif.

KLEINS
FOR MEN WHO
WANT THE BEST
Every good workman appreciates high quality in the tools and equipment he uses. To a lineman, however, this regard for quality is more than admiration for fine craftsmanship. The lineman daily trusts his very life to his safety strap, belt and climbers—and under such conditions high quality is more than a matter of pride.
Good workmen know that there's no substitute for experience. It is the years of expert craftsmanship back of every piece of Klein equipment that make Klein belts and safety straps—Klein climbers and grips—Klein pliers and wrenches the first choice of linemen today as they have been "since 1857."
ASK YOUR SUPPLIER
Foreign Distributor: International Standard Electric Corp., New York
This book on the care and safe use of tools will be sent on request.
TOOLS
KLEIN
Since 1857
Mathias KLEIN & Sons
Established 1857
Chicago, Ill., U.S.A.
3200 BELMONT AVENUE, CHICAGO

PRODUCT NEWS

Transformer Arc Welder (300)

A general-purpose transformer arc welder, designed for use on single-phase power lines of limited capacity, is available from Westinghouse in three output ratings: 130, 160 and 180 amp. The welder comes complete with line breaker, power cable with plug and receptacle, insulated electrode holder, electrode lead with holder and adjustment plug, work lead with ground clamp and adjustment plug, electrodes, helmet, wire brush and welding instruction manual. These welders, WT-13, WT-16 and WT-18, have 20 steps of current adjustments between 20 amp. and the rated maximum and provide two striking voltages: 65 volts for small electrodes on the lower half of the range; 50 volts for larger electrodes on the upper half of the range. Deion circuit breakers control the flow of current to the welder and give overload and short-circuit protection. Class B insulation is used and the design is said to give adequate natural ventilation. Listed by Underwriters' Laboratories

Electronic Contactors (301)

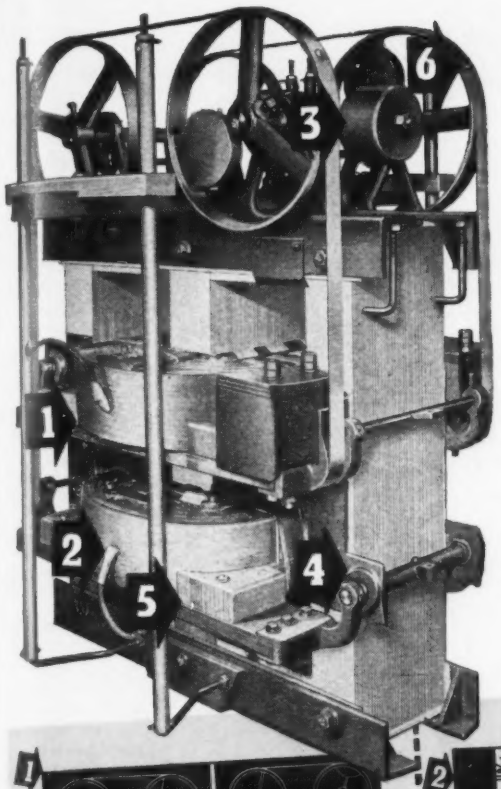
For resistance welding jobs involving exceptionally high speed operation or heavy primary currents of short time duration, Square D offers a new line of electronic contactors using ignitron tubes. These electronic contactors are offered to supplement the syncro-break and high-speed magnetic contactors which are recommended where lower installed cost and economical operation are important factors and where welders must operate over a wide range of weld times and duty cycles. Design of the new Class 8990 electronic contactors provides increased wiring space with power connections made near the center of the enclosure, allowing minimum bending of power cables. The contactor is assembled on a removable steel base plate. All control elements are grouped at the right-hand side away from tubes and cables and out of the path of any dripping from water condensation on tubes and hoses.

Electrodes (302)

A line of stainless steel electrodes in a full range of grades and diameters has been introduced by G-E. The electrodes are available in two types of coatings, one designed for a-c or d-c and the other for reverse polarity d-c operation. They can be used in all welding positions; are furnished in standard packages of 25 lb. in 1/16-, 5/64- and 3/32-in. sizes and in 50 lb. packages in 1/8,- 5/32-, 3/16- and 1/4-in. sizes.

Scale Drawing Pad (303)

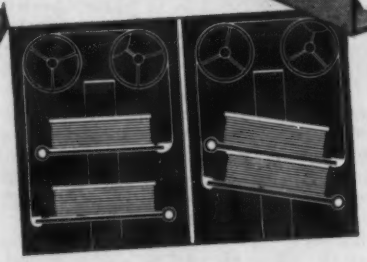
A scale drawing pad announced by Jiffy Sales Co. contains 75 sheets of tracing tissue, has cardboard cover flaps emprinted with scales for 1, ½, ¼, ⅛ and 1/10 in. and an isometric scale. Information on the backs of the flaps includes symbols for electric power and control and electronic devices; decimals of a foot; decimal equivalents of fractions with circumferences and areas of circles. The pad measures about 9x12 in.; price is $1.65, or $1.50 in lots.



MOLONEY *Constant Current* TRANSFORMERS

For closer regulation . . . faster coil action . . . longer lamp life. Moloney Constant Current Transformers with double-moving coil action, sturdy construction, and ball-bearing equipped moving parts require practically no adjustment or attention after proper installation. Available in Pole and Subway Types, with or without capacitors, and in air-cooled Automatic Station Types.

CHECK THESE SUPERIOR FEATURES ✓ ✓

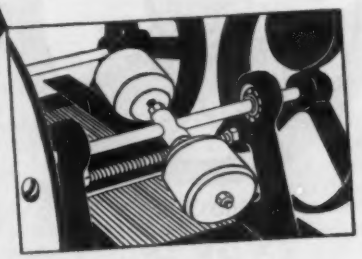


Double Moving Coils

Each coil moves one-half the distance of the single moving coil in ordinary regulators. Normal secondary current is attained quicker upon load changes or primary surges, with coils parallel throughout operation. Lower kinetic energy practically eliminates force on bumpers during short circuit.

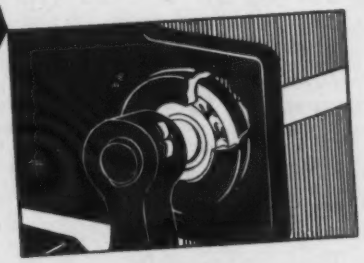
Extra-Flexible Leads

Extra-flexible cable is used for leads to prevent sluggish movement of the coils and to avoid service interruptions due to lead breakage. To protect and support them, leads are brought up to the terminals through heavy insulating tubes which are firmly anchored at both ends.



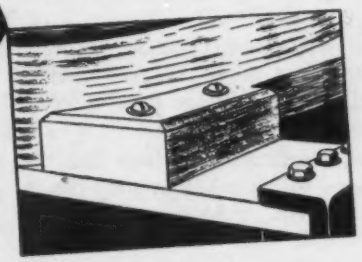
Adjusting Weight

The adjusting weight is mounted at the top on the shaft of one of the pulley wheels. It is arranged with a vernier for accurate and accessible adjustment. After adjustment is made, the weight is securely locked in position at the factory to deliver constant rated current. No adjustment is necessary when installing.



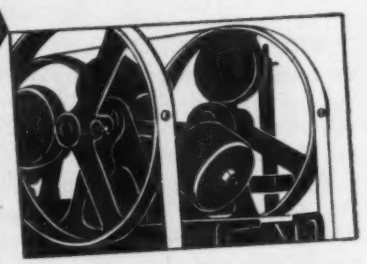
Ball Bearings

All moving parts are fitted with precision ball bearings to eliminate friction. The coils are hinged on ball bearings, the primary at one end and the secondary at the other. Hinge points are rigidly fixed by metal plates bolted to the core.



Coil Mounting

The supports on which the coils are mounted are designed to withstand impact between the coils themselves and impact between the coil supports and the bumpers, under the most severe operating conditions. Coils are rigidly blocked on the supports to maintain accurate alignment.



Stainless Steel Bands

Corrosion-proof stainless steel bands are securely fastened to the moving ends of each coil and to the pulley wheels to hold the coils parallel for the complete range of operation. These stainless steel bands last indefinitely.

MOLONEY ELECTRIC CO. ☆ ST. LOUIS 20, MO.

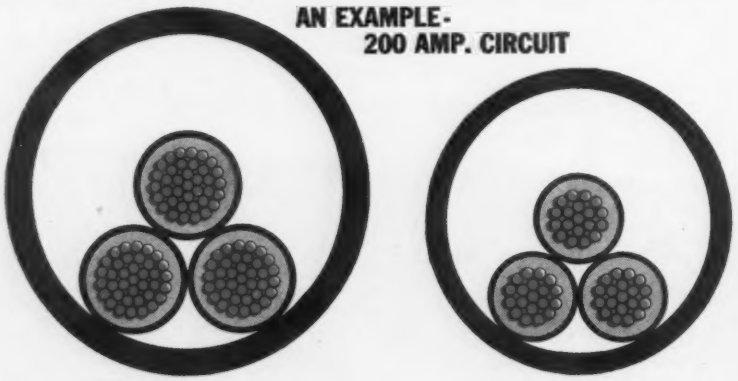
POWER AND DISTRIBUTION TRANSFORMERS EXCLUSIVELY SINCE 1896

. . . OVER 50 YEARS OF LEADERSHIP IN DESIGN, RESEARCH, ENGINEERING

CRESCENT
ENDURITE
Type RH

Gives Greater Current Carrying Capacity per Dollar of Installed Cost

AN EXAMPLE-
200 AMP. CIRCUIT



250,000 CM

TYPE R

Requires 2½" Conduit. Maximum permissible operating temperature 60° C.

For 100 ft. run cost for wire and conduit—approximately

$159.00

3/0

TYPE RH

Requires 2" Conduit. Maximum permissible operating temperature 75° C.

For 100 ft. run cost for wire and conduit—approximately

$116.00

Both figures are based on 330 feet of cable and 100 feet of galvanized steel conduit at PRESENT LIST PRICES. Saving shown—27%.

The superior heat resistant characteristics of CRESCENT ENDURITE INSULATION with its higher permissible operating temperature and therefore greater current-carrying capacity, permits the use of a smaller size of conductor, and in most cases smaller size of conduit at less cost than would be required for Type R Wire for the same load.

For light loads requiring small sized conductors, Voltage Drop is the determining factor in choice of wire size. Usually in sizes No. 6 AWG and heavier for power circuits or No. 1 AWG and heavier for lighting circuits, CRESCENT ENDURITE Type RH Wire & Cable gives the lowest installed cost-per-ampere of useful circuit capacity.

CRESCENT WIRE & CABLE

CRESCENT INSULATED WIRE & CABLE CO.
TRENTON, N. J.

Circuit Breakers (304)

Westinghouse reports that its new Quick-lag circuit breakers incorporate several improvements, chief of which is a new tripping action combining the inverse time limit characteristics of bimetal thermal action on overloads with the operation speed of magnetic trip action on short circuits. They are available in single or double pole, 10 to 50 amp., 125 to 125/250 volts a-c and have a redesigned Deion arc chute which eliminates the need for a vent screen in the bottom, thereby permitting mounting flush to pan. Other improvements announced are: a sturdier operating handle more enclosed than the former one; internal design requiring less handle movement; hole in handle to permit more satisfactory method of attaching handle extension for two-pole operation; smooth flush surface to eleminate dust traps. Over-all and mounting dimensions are the same as for the older Quick-lag.

Stationary Tachometer (305)

The O-Z improved stationary tachometer features a full ball bearing construction claimed to make possible use of the instrument continuously over long periods without lubrication and without loss of calibration accuracy. The company guarantees accuracy to within ½ of 1% in either direction of rotation. Graduations can be made to read from 2 to 40 times the minimum speed. The company is making two standard drives, a pulley drive by means of a ¾-in. twilled cotton tape and a method by which special swinging bracket and contact wheel adapt the instrument for inches per minute readings. The tachometer has 6-in. diameter, housing is 2¾ in. deep, indicating mechanism is fitted into aluminum housing, black enameled. An improved inertia damping mechanism is claimed to give a hitherto unattained degree of "dead beat."

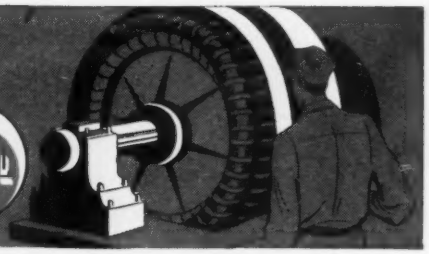
A-C Power Supply (306)

Superior Electric Co. reports that its new Voltbox a-c power supply was designed primarily for electric company test men but can be used in diversified applications. Three ranges of output voltages and two ranges of output current are available. Voltage and current are varied independently and are electrically isolated from each other. For metering purposes, a triple-range voltmeter and a double-range ammeter are supplied. These meters can be employed for measuring external voltages and currents by throwing lever-action switches located below each meter. This device may be used either on 115 or 230 volts 50/60 cycles; output voltage ranges are 0-30, 0-150 and 0-300 volts, current ranges are 0-5 and 0-20 amp.

Rheostat Motor Drive (307)

Ward Leonard has announced a small motor drive for rheostats, designed for remote and automatic operation of single or multiple stamped steel rheostats controlling generator voltages, motor speeds, lamp intensities, etc. Available for a-c or d-c, 115- or 230-volt operation, these units are suitable for control of 13-in. SS rheostats up to three plates, the company reports. Standard units have 30 or 60 sec. travel from the "all resistance in" to the "all resistance out" position but can be furnished for shorter or longer travel time. Constructed on a 13-in. diameter steel plate, they are for mounting on extended rheostat feet.

STANDARD ENGINEERS NOTEBOOK

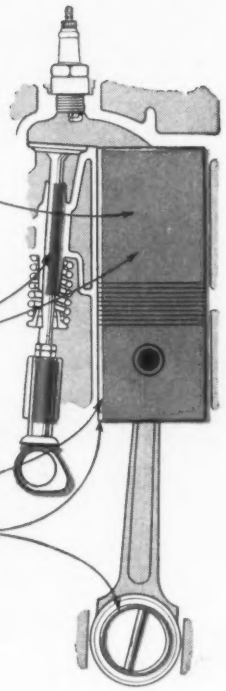


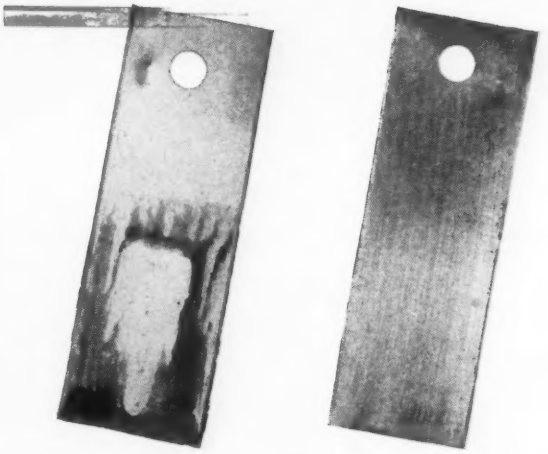
① Adhering agent in RPM Compounded Motor Oil keeps oil film on all parts after engine stops, even on cylinder walls.

② Rustproofing compounds prevent moisture that condenses on cooling parts from contacting metal.

③ No rust is formed to scrape off when engine starts, and cause excessive wear.

④ Constant lubricant film provides adequate and instant lubrication when engine starts.





This actual photograph shows how one HIGH-QUALITY MOTOR OIL "peeled" off almost all of this test strip of steel when it was placed in corrosive-moisture conditions similar to those in a cooling engine. The oil concentrated at one spot and the unprotected surface quickly rusted.

RPM COMPOUNDED MOTOR OIL kept this strip bright and shiny, completely sealed against rusting, when it was exposed to the same conditions. "RPM" compounds keep a constant rust-proofing lubricant film on engine parts at all times, whether they are idle or moving.

How RPM Motor Oil Rust-Proofs As It Lubricates

Rusting, caused by corrosive moisture, is the greatest source of wear in automotive engines (85%, according to some engineers). It can be controlled by using RPM Compounded Motor Oil.

Additional compounding for "RPM," perfected by Standard of California scientists, provides a rust-proofing lubricant film on internal engine surfaces. The heaviest moisture condensation in idle or cold-running engines will not cut through it.

Other compounds in RPM Motor Oil give it adherent qualities so the film stays on parts at all times. They also loosen and remove gum and lacquer, lubricate hot spots, resist sludge formation, bearing corrosion and stop foaming.

Trademark "RPM" Reg. U. S. Pat. Off.

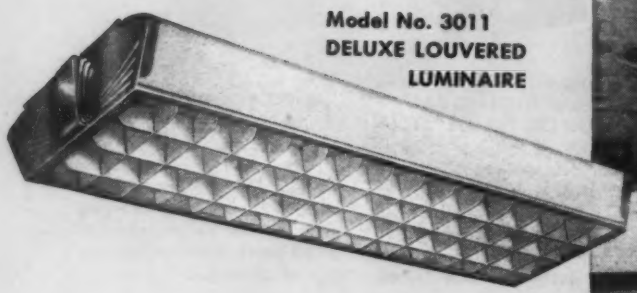
Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help — make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT

MITCHELL

Better Light for Better Banking

The new Peoples National Bank, Chicago, selects MITCHELL Fluorescent Lighting throughout! Beautifully-appointed section for bank officials is lighted by MITCHELL DeLuxe Louvered Luminaires No. 3011, in row mount. 50 foot-candles average maintained; provides efficient modern lighting for an efficient modern bank.



Model No. 3011
DELUXE LOUVERED LUMINAIRE

Main banking floor of the Peoples National Bank . . . completely lighted by MITCHELL No. 3011 Luminaires. In spite of the lofty ceiling, an average of 40 foot-candles is maintained. Entire layout planned by the Electricity Sales Department, Commonwealth Edison Company, Chicago, Illinois. (Contractor—Hultgren Electric Corporation, Chicago.)

Bankers, like all other progressive businessmen, know that really good lighting is a shrewd investment on two counts. First, it pays for itself in greater employee comfort and efficiency. Second, it builds better business because it promotes better public relations.

Naturally, MITCHELL Fluorescent Lighting is preferred by public-service institutions, because MITCHELL has established a superior reputation for lighting service in the institutional field. MITCHELL Lighting imparts dignity and prestige to the finest interiors, combining impressive appearance with effective high-level, evenly distributed, comfortable illumination.

For greater employee efficiency, for better public relations and more profitable business, MITCHELL Lighting is a gilt-edge investment.

The Peoples Bank installation is typical of hundreds which are building acceptance for MITCHELL Lighting—and bringing better business to the wholesaler. MITCHELL sales are clean package transactions—trouble-free volume business. MITCHELL installations are easy, smooth jobs for the contractor—time-saving, profitable business.

Mitchell Manufacturing Company
2525 CLYBOURN AVENUE, CHICAGO 14, ILLINOIS
In Canada: Mitchell Manufacturing Company, Ltd., Toronto, Canada
Far West: *Complete Modern Plant and Sales Office at Los Angeles Serves the Entire Pacific Coast Area*
1019 NORTH MADISON AVENUE, LOS ANGELES 27, CALIFORNIA

MITCHELL *Better Light for Better Business*

Makers of Commercial and Industrial Fluorescent Lighting Equipment Store Window Lighting • Spotlights and Floodlights • Desk Lamps • Portable Floor and Table Lamps • Bed Lamps • Ultraviolet and Infrared Health Lamps • Residential Lighting Specialties . . . Rad-i-Air Germicidal Units (made by Tru-Air Ultraviolet Products Co., Los Angeles)

Bridge Test Set (308)

Sylvania has a vacuum tube bridge characteristic test set, in a console unit including bridge and auxiliary switchgear mounted on the control shelf; electronically regulated power channels; bridge signal sources; amplifier; meters and other accessories. All meters except those for gas and heater cathode current are located on sloping panels. Voltmeters and respective current meters are mounted close together. All current meters have circuit jacks for external calibration.

Operating from a 1,500-watt, 220-volt, three-phase, 60-cycle a-c source, the unit will provide 0-600-volt, 100-ma. supply for plate and screen grid; 0-300-volt, 100-ma. for auxiliary and heater cathode; 0-300-volt, 400-ma. for emission; and 0-100-volt, 2-ma. for bias. A reverse polarity switch is provided for heater supply which can also be used as a second auxiliary. Filament supplies include 0-128 volts a-c, 100 va.; 8 volts d-c, 5 amp.; 35 volts d-c, 2 amp.; and 128 volts d-c, 1 amp.

The console is approximately 55 in. high, 70 in. long, 34 in. deep and weighs approximately 1,500 lb.

Strain Clamp (309)

Brewer-Titchener's new strain clamp No. 2115 is for all stranded conductors except ACSR, for which the company recently announced its new aluminum strain clamp. The No. 2115 will accomodate cable sizes from 0.187 to 0.4375 in., but is not offered for use on the higher strength galvanized steel or all-Copperweld cables used as ground wires.

Design is the snail-shell snubbing type, with an improved one-piece body pressed from heavy-gage steel, a construction said to avoid "weeping of acid" after galvanizing. Keepers are of forged steel, with double-wave grip. Large snubbing radii, smooth die-forged U-shaped conductor seat and large clamping section designed to prevent conductor damage and cable vibration effects are minimized by light weight, short connecting length and cable seat radius of 6 in. at mouth. A come-along loop is provided and only one clamping bolt need be removed for installation.

Test Instrument (310)

Robert C. Rindfleish & Associates have announced the Polyvoltester which they claim will distinguish between: (1) direction of phase rotation; (2) a-c and d-c; (3) positive and negative on d-c, without going to ground; (4) 220 and 110 volts a-c or d-c; will identify all wires, high phase and lighting phase in a 4-wire combination system and accurately locate blown fuses and make other continuity tests. This instrument will give accurate indications at frequencies considerably lower and higher than 60 cycles, according to the manufacturer.

SOLDERLESS—TAPELESS

Wire Connectors

SOLAR

SCRU-ITS

"MR. SCRU-IT" (Trade Mark)

Solar SCRU-ITS are used for connecting two or more wires without tape, solder, flame or tools. They are economical and easy to use—wire ends are stripped and SCRU-ITS screw right on to form a compact and efficient joint.

SCRU-ITS give better mechanical and electrical contact . . . eliminate possibilities of shorts, grounding and corrosion. Their compact size permits their use where working space is at a minimum.

Available in several sizes for connecting various combinations of wires.

EASY TO USE:

1. STRIP WIRE

2. SCREW IT

3. THAT'S IT with SCRU-ITS!

MILLIONS IN USE • HUNDREDS OF APPLICATIONS

"Roughing-in" or permanent wiring is simplified with SCRU-ITS . . . they thread on with a twist of the wrist . . . and the joint is complete!

- Fixtures
- Outlet Boxes
- Fuse Boxes
- Panel Boards
- Switch Boxes
- Lighting Devices
- Conduit Boxes
- Circuit Breakers
- Switch Controls
- Motor Connections

and many others.

U. S. PATENT NO. 1,933,555

DON'T TAPE
DON'T SOLDER
"SCRU-IT"!

• MADE IN FOUR SIZES

• MAY BE USED WITH SOLID OR STRANDED WIRES

Write for Data Sheet Z-3

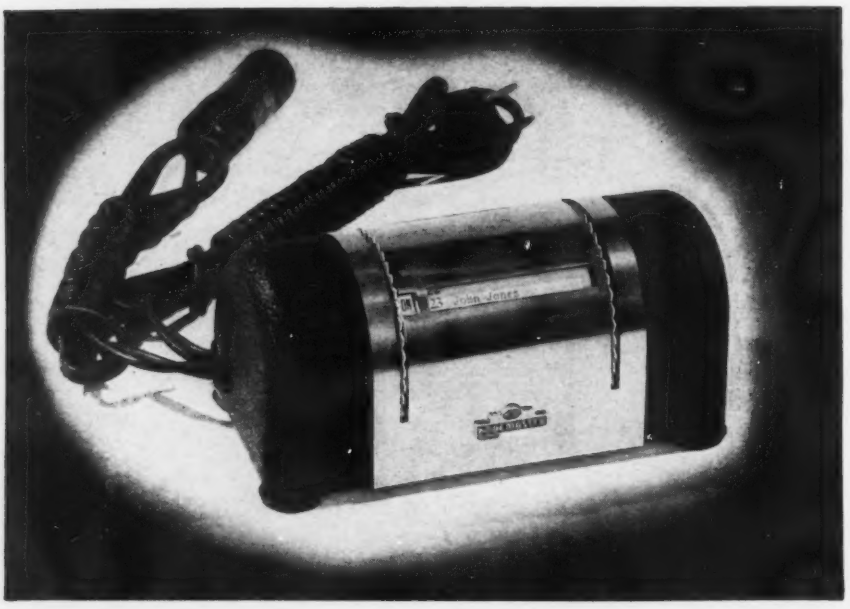
For complete specifications on SCRU-IT sizes, uses, prices, etc., WRITE TODAY.

SOLAR ELECTRIC CORPORATION

FACTORY and SALES OFFICES

WARREN, PENNSYLVANIA

Your customer "Gets his man" with FARADAY KODEMASTER



MANY a customer of yours wastes precious minutes tracing the man he wants from place to place through his switchboard operator. Faraday Kodemaster would signal him *instantly*, save time and money.

Kodemaster is the ideal control for locating individuals, and includes up to 30 code signals. Unique, compact and foolproof, it may be set up with *new* or *old* signal systems in any combination of bells, buzzers, horns, Kodaires, chimes.

Markets for Faraday Kodemaster in your area are practically unlimited . . . and so are the profits you can make by recommending and installing it. Investigate today!

Faraday Unipact signal units are interchangeable, "as easy as plugging in a toaster."

At your electrical distributor's

FARADAY
ELECTRIC CORPORATION
ADRIAN, MICHIGAN

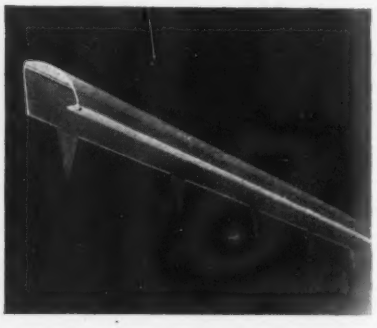
Wire Stripping Machine (311)

Williams Products Co. has announced the Codeco wire stripping machine for cutting, stripping and slitting one-, two- and three-conductor wire up to ½-in. diameter. One or all of the operations may be performed simultaneously on both ends of the cord. This device is operated by compressed air and is equipped with the Bellows-Senacon BM5 air motor and the Norgren 645-2 Lubro-Unit. Sixty pounds air pressure will operate the machine to process most cord, according to the manufacturer. Knives are adjusted to cut, strip and slit to the user's specifications; may be changed for other specifications by any operator. Dimensions: 18 in. wide, 11 in. deep, 25 in. high; weight, approximately 75 lb.

Arrester (312)

A heavy-duty expulsion type arrester for lightning protection on rural lines has been announced by G-E in 6- and 9-kv. ratings. A feature, according to the manufacturer, is the location of the internal gap in an interrupting chamber which contains gas-evolving material in the form of cellulose fiber spheres. A reserve column of spheres located above the interrupting chamber compensates for power-current erosion by replenishing the supply of spheres in the arc interrupting chamber after each discharge of the arrester.

Steel Quarter Round (313)



Lopo-Trim, a steel quarter round designed as a baseboard trim, a low-potential wiring raceway or as a quarter-round trim above or beneath installations of the company's plug-in strip has been designed by National Electric Products Corp., and is available in 6-ft. lengths. Projected from the back of the quarter round at 3-in. intervals are integral steel prongs. When the Lopo-Trim is installed, these prongs are pushed down behind the baseboard or the plug-in strip and design and positioning exert a tension that holds the quarter round in place. Two-piece matching elbows are available for rounding corners. Finish is satin grey.

Commercial F Line (314)

Moe-Bridges Corp. has introduced a commercial fluorescent line consisting of four standard base strips which may be combined with louvred attachment or glass and plastic enclosures to provide 16 fixtures. The base strips are 2- and 4-light, 40- and 100-watt; adaptable for single or continuous row application, flush or pendant mounting. The enclosures are of Vinylite plastic and Corning Alba-Lite formed glass. Bases and shields come individually packaged and labeled, making it unnecessary to stock complete fixtures, the manufacturer states.

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- The actual names of lines we represent are all leaders . . . trade marks that are recognized in the Electrical industry.
- Distribution through the General Electric Supply Corporation make the facilities of each branch and warehouse available to all.

. . . and back of this source of reputable products is our staff of trained specialists. They are available to help you . . . whether you are a contractor, electrical man in industry or an architect . . . with a wealth of information and data to help solve your electrical problems.

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ROYAL ELECTRIC CO., Inc., PAWTUCKET, R. I.

REPRESENTED BY: NORTHWESTERN AGENCIES, INC., SEATTLE, WASHINGTON
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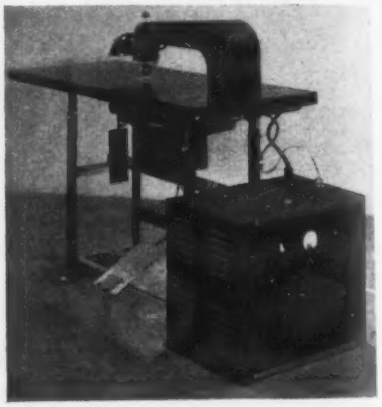
Seam Bonder (315)

Electronic Chemical Engineering Co.'s Electron-O-Bond, continuous seam bonder, consists of a commercial sewing machine type adjustable stand and 9-ply top, covered with laminated plastic. Clearance of the throat of the head of the unit is 17x6 in. Minimum speed is 3 ft. per min.; maximum speed 20 ft. per min.; bonding width may be variable from 1/6 to ¼ in. seam. The unit has movable control for various thicknesses, adjustable head, adjustable pressure on contacts, foot control for varying speed of drive, knee action switch for turning on and off power. The radio frequency generator is a-c operated, 115 volts, 60 cycles, single-phase. Maximum total input power is less than 1,000 watts. It has a filtered full-wave power supply thyratron control, using a pair of United Electronics 967 tubes in a special circuit. Oscillator operates at over 200 megacycles; uses two 127A tubes. The circuit is a push-pull line oscillator. One meter is utilized to check both grid and plate current at different times.



Stock Light (316)

The Stocklite, specially designed for lighting shelves and bins in narrow stock room aisles, has been announced by Goodrich Electric Co. It is said to provide eight different reflecting surfaces; has curved V-shaped reflectors at ends to eliminate glare and reflect light into bin interiors. Finish is porcelain enamel; a hood device permits attaching or detaching for maintenance.

F Channel Light (317)

Electricraft Corp. has a new fluorescent channel light for commercial and industrial use and occasional lighting in home, workshops, garages, etc. This light is available in three models: 20-watt single lamps; 40-watt single lamps; 40-watt for two lamps.

Fixture Stud (318)

Cannon Electric has added Type FS-3 no bolt fixture stud, furnished at present without locknut. The device is made of die-cast aluminum alloy, with a ⅝-in. pipe thread; has been tested to a breaking point of 600 lb. vertically.

Laminated Labels (319)

Topflight Tape Co. is offering laminated, pressure-sensitive labels in rolls to fit standard dispensers. These labels are laminated by adding a layer of transparent tape over the printed surface, thus strengthening it and protecting it against abrasion, oil, etc.

UNUSED POWER AND COMMUNICATION POLE LINE ITEMS IMMEDIATELY AVAILABLE FROM WAA

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In addition to the four Regional Offices shown at right, all other Regional Offices will dispose of $800,000 worth of used material and unused material in broken packages during March, April, and May. Each office will conduct Sealed Bid Competitive Sales. Make sure you have a chance to bid. Write each office today and have your name put on the list to receive the Sealed Bid Offering literature on Pole Line Hardware.

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In the next three months WAA will put $1,500,000 worth of unused items in standard package quantities on the market at rock bottom fixed prices—well below market. You can make your purchases through your distributor—or direct from the WAA offices in Los Angeles, Birmingham, Cincinnati, or Philadelphia. Most items have previously been offered to priority holders and anyone can arrange for immediate inspection and purchase. For specific details, specifications, prices, contact your distributor or the above WAA offices today.

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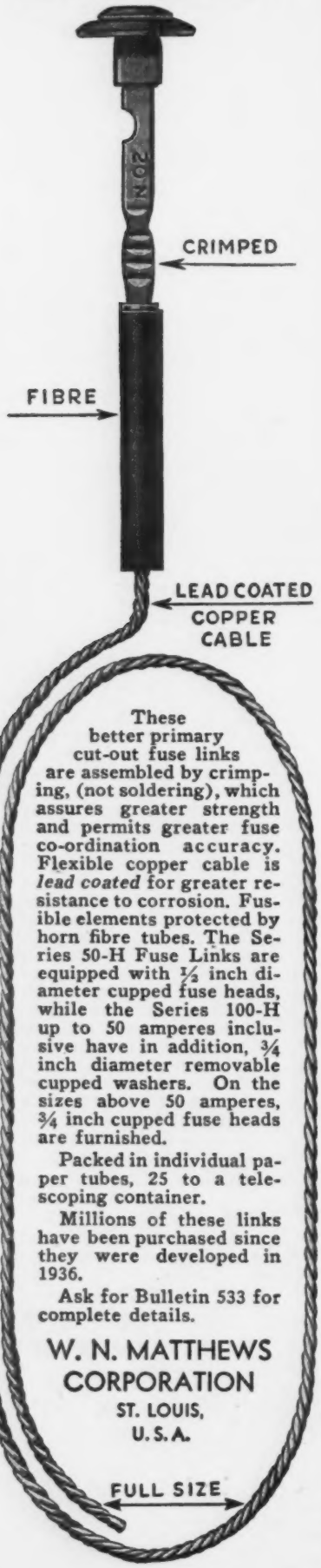
50-H AND 100-H MATTHEWS FUSE LINKS



These better primary cut-out fuse links are assembled by crimping, (not soldering), which assures greater strength and permits greater fuse co-ordination accuracy. Flexible copper cable is *lead coated* for greater resistance to corrosion. Fusible elements protected by horn fibre tubes. The Series 50-H Fuse Links are equipped with ½ inch diameter cupped fuse heads, while the Series 100-H up to 50 amperes inclusive have in addition, ¾ inch diameter removable cupped washers. On the sizes above 50 amperes, ¾ inch cupped fuse heads are furnished.

Packed in individual paper tubes, 25 to a telescoping container.

Millions of these links have been purchased since they were developed in 1936.

Ask for Bulletin 533 for complete details.

W. N. MATTHEWS CORPORATION
ST. LOUIS, U.S.A.

BULLETINS ETC.

Self-Supporting Cable (320)

A 52-page illustrated manual on self-supporting cable, "Okolite-Okoprene Self-Supporting Aerial Cables," has been issued by the Okonite Co. This book contains engineering information on the recently developed self-supporting cable construction for overhead distribution in utility systems, industrial power services and mining operations. Charts, tables and diagrams supplement the descriptive matter, answering many questions concerning the use of self-supporting cable. Sag and tension data, weights, current-carrying capacities and ice and wind loadings are some of the data included.

Insulating Varnishes (321)

A 40-page booklet containing technical and application data on G-E insulating varnishes has been issued by the resin and insulation materials division of the General Electric Chemical Department. The booklet includes specifications, electrical properties, film properties, cure and aging, chemical properties and baking and air drying cycles of each type. Types consist of black baking, black air drying, clear baking, clear air drying, black baking and air drying, clear baking and air drying, sticking varnishes and air drying and baking enamels. Thirty-six grades are described.

Connectors (322)

A 64-page illustrated catalog, containing specifications on all types of Hydent electrical connectors for conductor sizes from No. 22 to 2,000 MCM has been issued by Burndy Engineering Co.

Turbine Maintenance (323)

Information for proper maintenance of general-purpose turbines is contained in a new handbook announced by Westinghouse. It first describes the steam turbine, explains how it operates, and tells how it should be installed. Directions for piping, joint sealing and lubricating are given. Dismantling of the turbine for complete inspection once a year is recommended, and points to be checked and recorded are listed. Necessary repairs and adjustments are discussed under the heading of the various parts—rotor, bearings, glands, governors, nozzles, overspeed trip, speed changer, reduction gears, and oil parts. The final chapter gives emergency hints for quick reference if the turbine is not operating properly.

Equipment Bulletin (324)

A bulletin has been released by Superior Electric Co., illustrating and describing the company's line of Powerstat variable transformers, automatic voltage regulators, Voltbox a-c power supplies, and special custom-built equipment such as remote positioners and theater dimmers.

Induction Heating (325)

Tocco Division of Ohio Crankshaft Co. is offering a 59-page booklet on induction heating, covering history, principles and applications and giving technical data. Illustrated.

Transformers (326)

Pennsylvania Transformer Co. offers an 8-page bulletin, "Ask for Askarel," dealing with non-inflammable, liquid-filled transformers in distribution and power sizes. Illustrated.

Lighting Fixtures (327)

Day-Brite Lighting Inc. has issued Industrial Fixture Bulletin 30-A covering its Day-Line. Recent price changes are included.

Electronic Catalog (328)

Radio City Products Co.'s new catalog, No. 128, lists latest improved RCP models and the Reiner line of precision equipment.

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Please send me information about following CIRCLED items:

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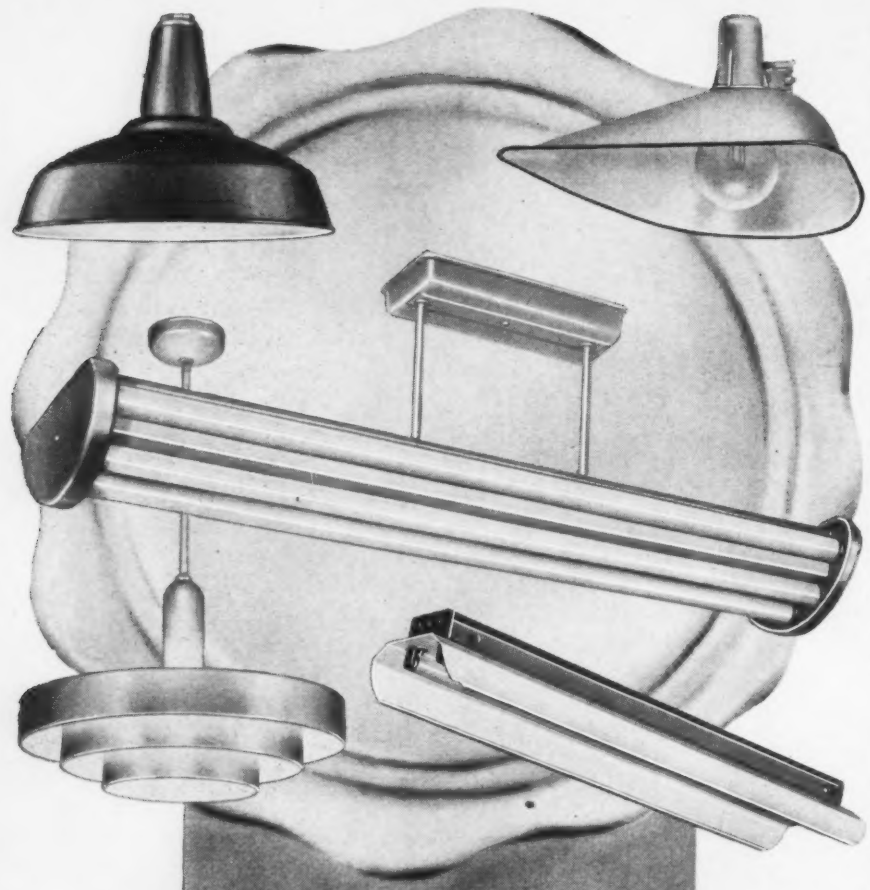

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ELECTRICAL BOOKS

PRINCIPLES OF RADAR, Second Edition, by the Staff, Massachusetts Institute of Technology, 820 pages, 6x9, McGraw-Hill Book Co., $5.

Describes functions and components of radar systems and discusses in detail typical system components. In the second edition, chapters on Timing Circuits, Indicators, Modulators, Transmit-Receive Devices, and Synchros and Serve-mechanisms have been completely rewritten, and the subject of Propagation has been added. Presentation of the following subjects has been improved: Automatic Frequency Control, Impedance Matching, and Super-regeneration.

NATIONAL FIRE CODES VOL. V, NATIONAL ELECTRICAL CODE, 1947 Edition, 408 pages, 6 x 9 in., cloth bound, National Fire Protection Assn., $2.

Makes the code available for the first time in convenient desk reference size, matching the other four volumes of fire codes. Out ahead of the Underwriters' paper-bound editions, this one has such features as large, easy-to-read type, a binding which allows the book to stay flat where opened.

DIRECT AND ALTERNATING CURRENTS. Third Edition, by E. A. Loew, 748 pages, 5x8, McGraw-Hill, $5.

Brings up to date this basic text, which stresses fundamental principles, especially the theory of electric circuit, and demonstrates their application to electric machinery.

REYNOLDS ALUMINUM ALLOYS AND MILL PRODUCTS DATA BOOK, 248 pages, 6 x 9 in., wire bound, Reynolds Metals Co., Inc., $2.

A wealth of data on the properties, processes of manufacture and mill products of aluminum and its alloys. The book includes 106 tables of detailed information.

TRIGONOMETRY REFRESHER FOR TECHNICAL MEN, by A. Albert Klaf, 629 pages, 5x8, McGraw-Hill, $5.

Thorough, lively, and just what the title says it is. By the author of *Calculus Refresher for Technical Men.*

Following are three more books in the Modern Electrical Series, authored by E. S. Lincoln, consulting engineer and Fellow AIEE, and published by Essential Books, Duell Sloan & Pearce Inc. Using numerous photographs of the equipment he describes, Lincoln has taken a uniform approach to his various subjects, building up from simple, non-mathematical descriptions of underlying principle to detailed discussion of equipment. The books probably will have their maximum appeal to engineers desiring to acquaint themselves with techniques as they are actually applied, and to electrical men desiring to undertake studies which do not require a high degree of mathematical preparation.

INDUSTRIAL ELECTRICAL CONTROL, 374 pages, $3.

SWITCHBOARDS AND PANELBOARDS, 150 pages, $3.

INDUSTRIAL ELECTRICAL HEATING, 192 pages, $3.

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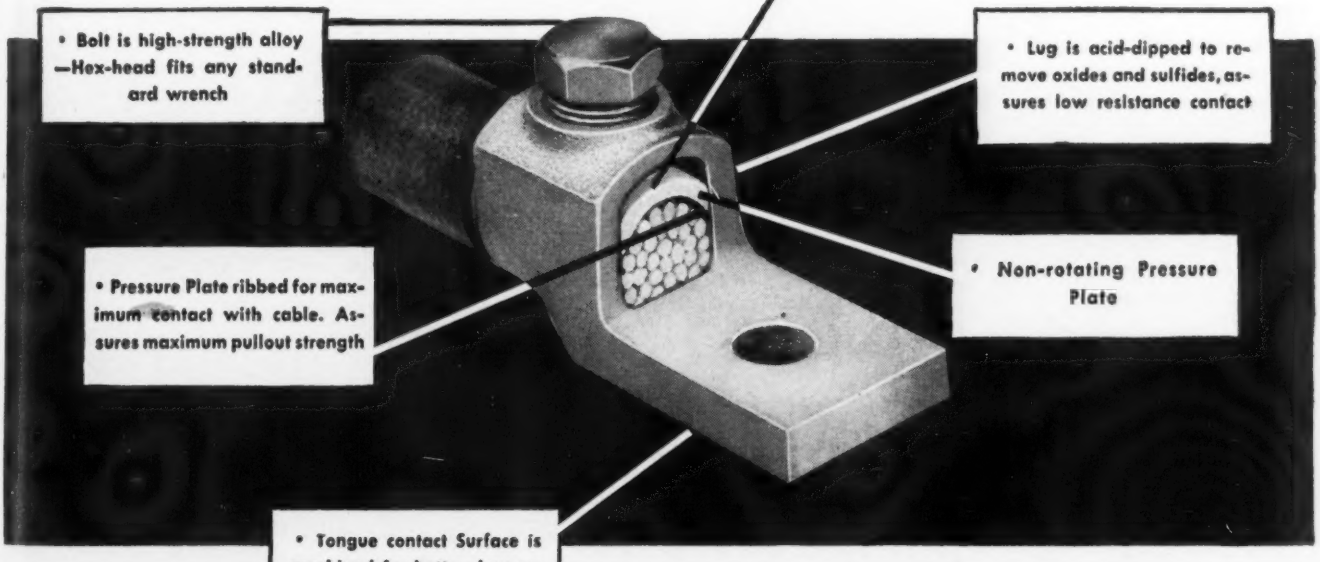
• Bolt is high-strength alloy —Hex-head fits any standard wrench
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ELECTRA'S HUSBAND

Every Man His Own Electrician

"WHEN I married an electrical engineer, I thought that at least all of the electrical things in the house would be kept in working order," Electra said one Sunday morning as I lolled in my favorite chair reading the morning paper. "If you had any interest in things around the house, you would get dressed and fix the switch on the hall desk lamp and put a new extension cord on my sewing machine. And you were going to do something about that tangle of wires in the bedroom."

"Let me finish the sports' section and read the comics and I'll do it," I said.

"That's what you always say," Electra remarked. "And then you never do anything."

Later in the morning as I rummaged in the shoebox that holds my meager assortment of tools, I recalled a survey conducted by one of the popular magazines on the habits, hobbies and preferences of its subscribers. The survey and the jobs that Electra had assigned to me raised in my mind a question—"Why is it that so many otherwise normal men (backed up by argumentative wives) consider themselves qualified electrical experts?" With little or no knowledge, they will tackle any kind of an electrical repair job in the home—fearlessly, confidently, and, I must confess, with some reasonable success. Most of us who profess to know something about the

theory and application of electricity, have seen these amateurs blissfully whittling at the hot-leg of a circuit with a dull pocket knife, preparatory to splicing on some kind of a "Boob McNutt" extension.

And if perchance their whittling should short the circuit and blow a fuse with a minor display of fireworks, they think nothing of putting in a new fuse with a capacity double that specified in the National Electrical Code.

The magazine survey which analyzed the domestic propensities of these Mr. "Fix-Its" reveals some interesting relationships in the relative kinds of jobs they will undertake. Because the magazine appeals to scientifically inclined readers, it is conceivable that they may like to do more than the average amount of repair work around the house. At any rate here are the percentages of the subscribers surveyed indicating their specialties:

Electric wiring	83%
Simple carpentry	82%
Plumbing	68%
Wax or polish car	60%
Repair car	41%
Repair radio	29%
Painting	6%
Masonry	1%
Refinish furniture	1%
All repair jobs	2%

There may be some reasonable explanation as to why such an overwhelming majority of these people classify themselves as electrical experts above all else. Could it be the electrical industry's fault? Quite probably.

The list permits of some intriguing speculation. Is it because the tasks become messier and the work gets harder that so few are concerned with painting or refinishing furniture? It would appear obvious, too, that the intricacies of a radio circuit are too much for most of the electrical experts. And there must be some mistake in the proportion of those who profess to like waxing and polishing the family car. That really *is* work.

Perhaps if some of the electrical wizards had been subjected to the embarrassing experience that befell me early in our married life, they could disqualify themselves as experts as I did for a long time. My boss had come to the city from the East for the first time. And Electra invited him out to Sunday brunch. Since she and he were of the same religious faith, they went

to church, leaving to me the final preparations for the extra special meal.

Electra was and still is especially proud of her strawberry waffles. We were to have them on that auspicious morning. One of my chores was to plug in the waffle iron at a previously specified time. This I did.

Electra and the boss arrived and preparations for brunch stepped up materially. Suddenly there was a chilling whisper from the dining room.

"What did you do to the waffle iron? It won't heat."

Excusing myself, I went out to see what had happened. Quick examination showed that the plug was in the iron securely. A glance at the wall showed that the cord apparently was attached to the outlet. A flick of the light switch indicated that the fuse was all right. The ensuing sarcastic conversation attracted the boss, who stood in the door watching and listening.

Finally Electra walked over to the baseboard and picked up the cord connected to the outlet. It led, not to the waffle iron, but to a floor lamp. She picked up the waffle iron cord, which also lay on the floor, plugged it in, and said:

"So I married an electrical engineer and he can't even heat up a waffle iron."

Somehow the boss still remembers that incident and needles me. But for years I didn't do any electrical repairing around the house.

FWDs HELP GAIN ON LINE CONSTRUCTION BACKLOGS

NOW, more than ever before in history, more people want more of the services utilities provide. Demands exceed facilities. Much work must be done to catch up on the "backlogs."

Rugged, dependable FWD four-wheel-drive Utility Trucks . . . utility-engineered to do more work, on or off the highways . . . can help you gain on your line construction and other backlogs.

A recent independent survey indicates FWDs are America's No. 1 heavy-duty line trucks, gaining renewed utility preference many times faster than any other truck. FWD trucks have attained an outstanding position in utility service. Over 200 companies operate FWDs, some having purchased 200 or more.

For complete information see Graybar or write—

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National Distributors—Graybar Electric Company

REGIONAL SERVICE: Arizona—Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—The Four Wheel Drive Auto Co., 1339 Santa Fe Ave., Los Angeles 21, and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Steffeck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; OKLAHOMA—Halliburton Oil Well Cementing Co., P. O. Drawer 471, Duncan; OREGON—Feenoughty Machinery Co., 112 S. E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So. Seattle 2, Glenn Carrington & Co., 91 Columbia St., Seattle, and Feenaughty Machinery Co., 715 N. Division St., Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne; Alaska—Glenn Carrington & Co., Nome, Fairbanks, Anchorage, and The Graybar Electric Co., in over 90 principal cities.

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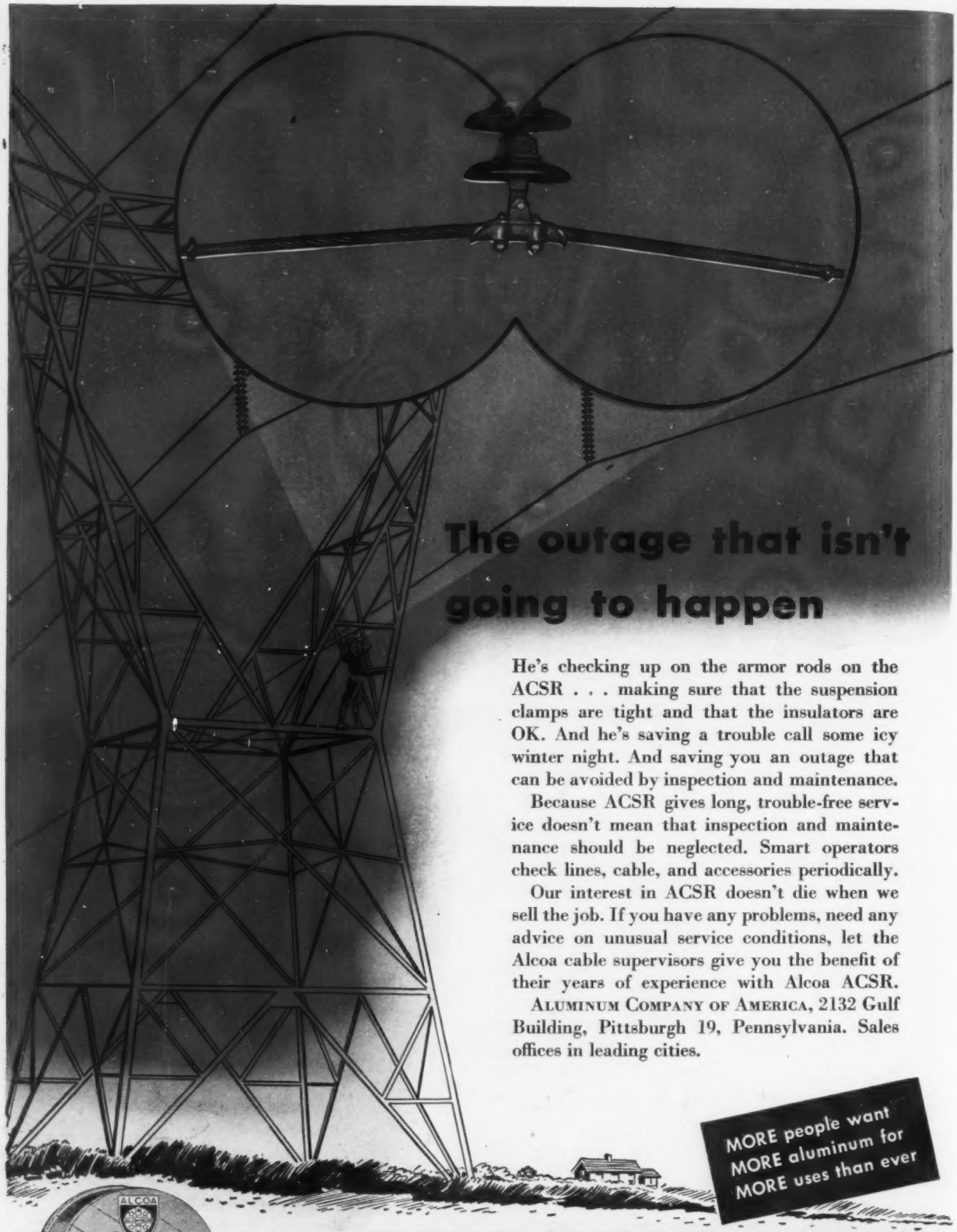

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How To Handle Stubborn People

Ben L. Wells

The second part of an address given at the Pacific Coast Electrical Assn. conference in Fresno, Dec. 5, 1946. Material in this part was prepared with the cooperation of Roswell H. Johnson, Ph. D., psychologist, and is copyrighted and reprinted here by authors' permission.

Stubborn, obstinate, "mulish" and unyielding people present one of the most difficult and trying problems of a leader, or for that matter anyone. The effort necessary to persuade such a person to act or buy may easily exceed the energy required to obtain cooperation from a score of less rigid, less resistant people.

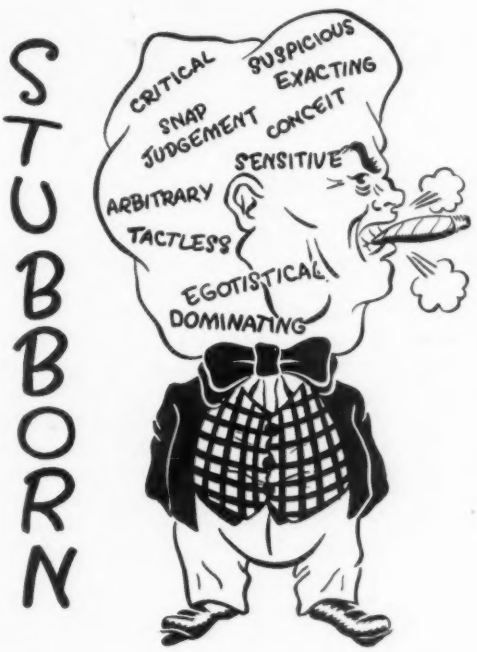
The fundamental principle in handling people, every leader knows, is that people will produce more if they are handled according to their own individual dispositions, rather than as a herd. A stubborn person is best handled in one manner, while a shy person might best be handled entirely differently.

Reason people differ is because of their varied personalities or temperaments. The traits that distinguish people can be grouped into five major components of temperament: 1. *stubbornness*, 2. *shyness*, 3. *depressiveness*, 4. *selfishness*, and 5. *impulsiveness*.

Everyone possesses some of all of these traits. The very stubborn person may be shy in some respects. The impulsive person may suffer periods of moodiness. Each person usually shows more of one trait than another, which colors the personality. This is called his predominant trait and forms a rough, rule-of-thumb basis of classifying his temperament. It must be remembered, however, that these traits are not necessarily constant.

In order to apply the principles of handling stubborn people one must understand the stubborn person and how his mind works. While all stubborn people vary among themselves in their characteristics, there are approximately 15 situations in which there is considerable similarity.

The picture of a stubborn person on this page portrays most of the outstanding traits that are generally associated with stubbornness. These include *suspicion*, *conceit*, *tactlessness*, *snap judgments*, a *critical*, *dominating* attitude, along with an *egotistical* and a *sensitive* nature. He may seem to be very "hard-boiled" and insensitive, but the speed with which he explodes when crossed betrays extreme sensitiveness.



An excellent approach to understanding him is to "take his hard head apart," much as one would disassemble a machine. We obtain the best results from a machine when it is handled in the manner for which it was built.

The stubborn head can be divided into three major parts. Traits most commonly associated with stubbornness are those of *sarcasm*, *arbitrariness* and *touchiness*. (See the second picture.) These are traits that make him so hard to get along with. Likewise they are the qualities which reduce his effectiveness as a leader. Others do not cooperate with him because of these undesirable traits.

But all is not bad about this hard head. *Arbitrariness* is a subdivision of a major trait which may be called *dominance* (ruling or commanding). *Persistence* is also a subdivision of this same trait. In fact arbitrariness may be considered to be a misuse of persistence. In order to control a situation, a leader must be persistent, as long as he is in the right. However, if he persists in having his way when he learns he is wrong, he is said to be arbitrary.

In the same manner, *sarcasm* is a subdivision of the *critical* trait. The word *critical* includes a knowledge of what is right, as well as what is wrong. It is a much misused word, as well as a misused trait. *Analytical* is also a subdivision of the critical trait. A leader must be analytical so that he will know when he is right or wrong. To be sarcastic is a misuse of the analytical ability.

Touchiness, sensitivity and *understanding* all belong to the same family. The stolid, thick-skinned individual is neither touchy nor sensitive, but neither does he have understanding. The latter is a very necessary trait of leadership, as it is absolutely necessary to understand people in order to lead them. However, it is not necessary to go to the extreme of being touchy merely because one is sensitive.

The desirable qualities under stubbornness then are the *capacity* for *analysis, persistence* and *understanding*. In handling a stubborn person it is important for the leader to appeal to these qualities. Likewise it is important not to arouse the undesirable traits of sarcasm, arbitrariness and touchiness. To do this reduces the chances of obtaining cooperation from a stubborn person.

It is essential that the leader possess and develop the qualities for analysis, persistence and understanding in himself and control his own tendencies toward sarcasm, arbitrariness and touchiness. Anyone who directs others must himself possess the desirable traits listed under stubbornness. It is because of these traits that one finds stubbornness in so many persons of authority. Because of persistance, a driving force, willingness to work, tirelessness and ambition they force themselves up to the top.

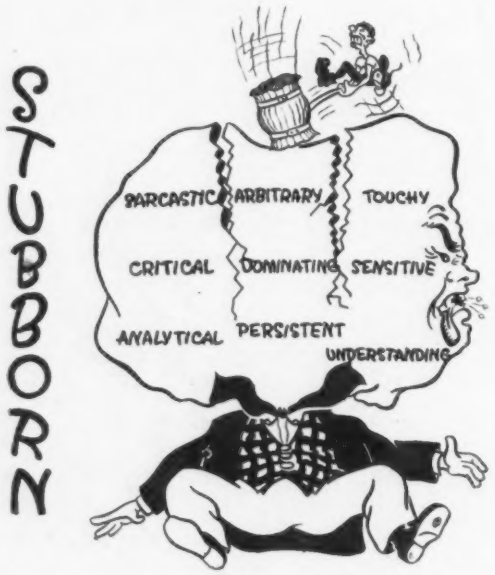
If he has leaders under him the leader must also select his subordinates from those who possess the necessary traits of analysis, persistence and understanding. This is difficult, for most people either do not have enough of these desirable traits or they have an excess, resulting in sarcasm, arbitrariness or touchiness. The leader of other leaders must be able to show his subordinate leaders how to control and to submerge these undesirable traits that arouse resentment in others.

For example, the stubborn person plans, but he often does so *without bringing his associates into the plan.* Then he complains bitterly that people do not cooperate with him. How could they? They did not know what he wanted them to do.

The stubborn leader should take the jackhammer of self control and knock off his rough edges. If he will *coordinate with his associates* he will increase the cooperation he receives and stop being a lone wolf.

The rough edge of *conceit* is largely a misuse of *ambition.* The conceited person wants to be considered important without doing the things necessary to become important. A conceited person is hard to handle and is unable to direct others successfully. He cannot command respect. The conceited person who wants to be a leader or a good salesman or lead a successful life and be able to handle stubborn people should knock off his rough spots by dropping the *big show attitude.* It is not necessary for a really important person to make any particular effort to convince people of his importance.

One of the most difficult problems of a leader is to *hold people to standards.* Many loyal, dependable workers who know their jobs and could otherwise become leaders cannot be promoted because they will not try to hold other people to standards. However, the stubborn person often goes to extremes in holding people to standards and is *too exacting.* The stubborn leader should knock off his rough spot and *be satisfied with practical results.*



Good leaders should be *methodical.* The extreme of this is to *hold on to outmoded methods.* Most people want to do an effective job and do not like to use wasteful methods. The good leader should be flexible, changing his methods as necessary to meet changing conditions. The stubborn person usually resists change.

Of course there are other factors involved in controlling a situation. However these presented are the most important. The conclusion that can be drawn from this analysis is that *one stubborn person cannot handle another stubborn person.* Therefore the first step in learning to handle stubborn people is to control the undesirable stubborn traits in oneself.

A second important conclusion to be derived is to *avoid aggravating the undesirable stubborn traits in others.*

The amount of stubbornness shown by an individual varies according to the situation and the person with whom he is dealing. A good leader will be careful to avoid arousing the strong emotions of the obstinate person. Rather he will keep him calm and appeal to the sound traits of persistence such a person also possesses.

Since good leadership, as indicated in the last article, in January (p. 39), consists of the knowledge and skill needed to handle all types of people successfully, there are many tools that a person needs in handling this kind of person. It is not claimed that each tool presented in this discourse will work every time and in every situation. Nor will it be possible in the space allotted for this article to go as thoroughly into the detail of special techniques and fine shades of finesse often required in particular cases. In presenting this material in a course of training for leaders these aspects of the problem can be explored more deeply.

It will suffice here to touch upon these tools in general. They are not new, but they are practical. Students of psychology may give them other names or wording but what is needed most is a simple and understandable way to handle this type of individual.

These ways have been recorded only after observation of their use by successful leaders. They fall into four major groups:

1. Methods of presenting them an idea.
2. Restraints of arbitrary action.
3. Protection of their ego and feelings.
4. Prestige and ability of the persuader.

Now let us consider some examples. first of presenting an idea to a stubborn person. The chances of persuading such a person to act favorably may be greatly increased by careful consideration of the method by which the idea is presented. Proved methods can be used, though these are not infallible nor do they automatically assure success. It is important to study the person involved before selecting a method and then to use skill in presenting.

Present the situation or problem before making a recommendation.

When making a recommendation or presenting an idea to another for approval or action, one has probably studied the situation carefully himself. He has reached his own conclusions based upon consideration of all the facts available. In presenting recommendations to a very stubborn individual the recommendation should not

be made, ordinarily, until the situation has been outlined and the background given. In this manner the stubborn person will have some basis upon which to make his decision. If the recommendation is presented cold, the chances of a negative answer are increased.

Permit the stubborn person to participate in the demonstration.

A salesman for an electrical motor company used the following method to convince irate customers that the cause of burnt-out motors was due to overloading them by the customer. A mere statement to the customer that he had overloaded it merely would increase his anger.

The salesman first made a quick survey to determine the condition and, without telling the customer so, decided that it was overloading that caused the burnout. He then began to measure the amount of overload, asking the customer to take down the figuring while he made the necessary measurements. He determined the factors in the load, told the customer the calculations to make, without indicating that he was measuring overload in particular.

When the calculations were finished they might show the extent of the overload. The salesman then went back over the figures with the customer until it was established that the customer had been overloading the motor.

Extreme tact must be used to avoid antagonism when a stubborn person finds he is wrong.

Use of concrete examples is good. Ideas expressed in terms of known examples are easily understood and interpreted. The new is tied in with the familiar and leads to a logical acceptance more readily. There are several variations of this principle and several techniques to employ. However in every case it is well to

Avoid too definite a stand.

In some types of group negotiations, where one group is trying to obtain any concession possible from the other, it is often wise for the group that has something to give to avoid a too positive stand on a subject. To do so may inflame the other group, give them a basis for crystalizing a demand, merely because they think they would profit at the others' expense.

In consideration of ways to use the second tool, *restraints to arbitrary action*, one of the important techniques is to

Refrain from judgment.

Because he is prone to quick and negative decisions, keep the stubborn person from giving his answer too soon. Discuss the problem beforehand and ask him to reserve his decision until a later date. He is usually quite willing to do this.

Calm him down. Usually easily excited, the stubborn person is often not amenable to reason. Calm him down before proceeding with the discussion. In order to win a point, retain your own calmness. This in itself exerts a quieting effect on the other party.

Avoid arguments. Discussion with a stubborn person quickly turns into a heated argument. Because of his stubborn nature, it is almost impossible

to win an argument, even when he knows he is in the wrong.

Putting someone on the spot by dropping a "hot potato" in his lap is often done by the stubborn person. If the other person holds it, he will be burned. But if he seemingly does not notice it, and lets it fall through his hands, the stubborn one will have lost its effectiveness.

Protect the ego and feelings of the stubborn person.

The really stubborn person usually has a powerful ego and sensitive feelings. It is very important to protect his ego, to avoid hurting his feelings.

It is unfortunate, time consuming and perhaps infantile but it is often necessary to come up on the "blind side" of an obstinate person. This method has been used by successful leaders in obtaining their cooperation. It should not be used with logical, mature people.

Let the stubborn one think it was his idea.

A great weakness of the stubborn individual is his overwhelming desire to be a big idea man. Actually he is not creative or original because he permits his strong fears to hold him back. Therefore he will often conform to a new plan if he is allowed to think it was his own idea.

Of the many ways to accomplish this one is to discuss the idea ahead of time without any attempt to reach a decision or get an opinion. Later in discussing it again he will accept the fact that it is his own idea and probably conform to it.

Avoid a decision in the early stages. The stubborn person prides himself on his decisiveness. Believing that making quick decisions is important to an executive, he will often make a quick decision without a semblance of the facts. Unfortunately his decisions based on the ideas presented by others are predominantly negative. Prevent this negative decision in the early stages.

Of the final tool named, *qualities of the persuader*, it need only be said that it is human to be impressed by someone who has achieved a position of prominence in his field. Therefore the leader should do everything practical to establish a reputation for soundness and reliability.

Prestige must necessarily be built by a step-by-step process. Very few people achieve it overnight. In order to establish prestige with employers, associates, employees or customers, one should increase the number of times he endeavors to influence them favorably. It is well to start on a small scale where a reasonable chance of success is indicated.

Good leaders know how to handle obstinate people. Sometimes a man has the authority to force people to do his bidding. But the leader who relies on authority alone is handicapped.

It is a fundamental trait that people will carry out an idea with more vigor and success if they have had some part in the planning than one to which they are opposed but are forced to support because someone has authority over them. The leader who supplements his authority with persuasion can obtain much better cooperation.

Some people are very hard to persuade and yield only to the pressure of authority, but in general persuasion should be tried first. After all, labor legislation has stripped leaders of much of the authority they once possessed. It is now more necessary to use persuasion than ever.

And where the leader has no authority over others, as in the relation of the salesman to the customer, or his competitors in a trade association, the one with the persuasion usually wins.

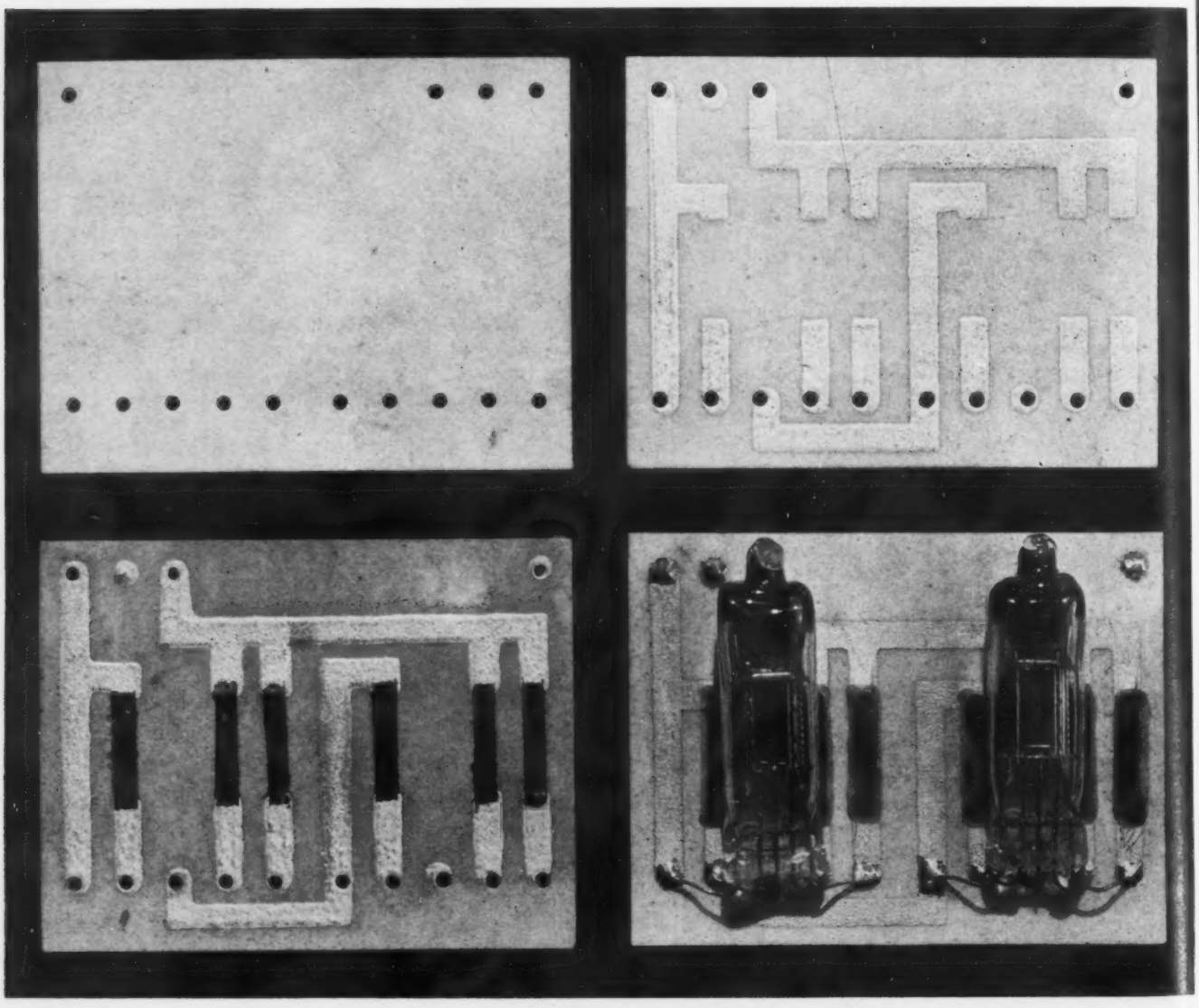
PRINTED CIRCUITS

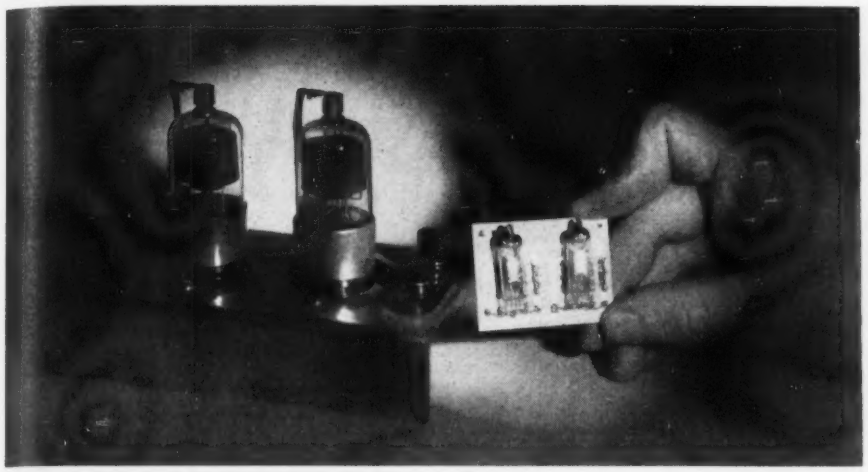
An article by Cledo Brunetti and Philip J. Franklin, both of the National Bureau of Standards, digested by Electrical West, but including all their information concerning the printing technique proper.

The printing of wiring and circuit components on an insulated surface is one of the most important of the processes evolved during the war. Developed by the National Bureau of Standards in cooperation with electronic manufacturers for the tiny generator-powered radio proximity fuze, the process promises to simplify production methods, and to accelerate the manufacture of cheaper, more compact and more uniform equipment.

The methods are applicable in the design of numerous industrial and commercial devices where extreme ruggedness and small size are imperative. A conventional radio, for example, now characterized by a maze

Fired and shrunk steatite plate is starting point. Second, wiring is stenciled by means of template. Third, resistors are added by painting them in. Finally, components such as tubes are soldered on.





of components, may be replaced by a compact circuit printed on a small flat plate, eliminating much of the third dimension and making the unit simple to check and repair. Other specific applications: pocket radios, personal radio telephones, miniature hearing aids, meteorological instruments, and electronic control circuits.

Present investigations at the bureau reveal a number of feasible and practical electronic printing methods. Variations of the stenciled screen printing process include hand printing or spraying. Another method involves the use of photography and an abrasive blast. A third is an adaptation of the chemical methods of silvering mirrors. Mechanical processes include metal spraying, metal sputtering or evaporation, the use of foils, and stamping.

The principal effect of these methods is to reduce electronic circuit wiring to two dimensions.

Four simple techniques are the key to the electronic printing process. First, the circuit wiring and inductors are printed or stenciled with silver paint on a chassis or base material, such as a plate of steatite. Second, the resistors, in the form of a carbon and resin mixture, are stenciled or sprayed on the plate through masks that locate them accurately between designated end tabs. The small disc type capacitors, of high dielectric ceramic, are then applied directly to the wiring on the plate. Last, other components, such as tubes, are fitted into properly located holes in the ceramic and soldered in place. In this manner, a compact electronic circuit assembly, readily adaptable to high production techniques, is obtained.

Any insulating surface may be employed as a base plate for the wiring. Thus, electronic circuits may be printed on glass, porcelain, plastics, cloth, paper, and any material having suitable insulating properties. Steatite, a hard and dense ceramic material, is well adapted for use as a base material. In fabricating steatite, carefully selected ground talc and small percentages of clays, fluxes, and organic binders are worked with the addition of water into a uniformly plastic condition. The mixture is then molded into plates under pressures between five and ten tons per square inch. The plates are dipped into glass-forming materials and fired in kilns at a temperature of about 2,400°F, producing a hardness approaching that of sapphire. The resulting material, steatite, is unaffected by water, solvents, or even acids—important factors in its electrical use.

The first step in printing a circuit is to apply a pattern of silver lines to the ceramic, either directly with a brush or by using a silk or metal stencil. The stencil is produced by coating silk or metal screens with a substance such as gelatin or polyvinyl alcohol which is made photo-sensitive by treating with potassium dichromate. A sheet of paper bearing the desired wiring pattern is held tightly against the screen and exposed to strong light. Exposure "fixes" the chemicals on the screen except for those portions beneath the wiring diagram. The silk or metal is then washed in water, and those parts not exposed to light dissolve in the water and wash out, leaving openings in the screen corresponding to the desired wiring diagram.

The stencil is laid over a clean ceramic plate and silver ink is brushed over it. An impression on the plate exactly like the wiring of the circuit is thus obtained, but instead of copper wires there appear a group of silver lines. The silver paint consists of very finely divided silver or silver oxide mixed with a binder to make a paste and thinned with a solvent such as acetone. After impression of the pattern, the plate is heated to a temperature between 1,300° and 1,500°F, bonding the silver permanently to the ceramic. Paints have been developed which require firing at considerably lower temperatures if desired. The principle advantage which results from higher temperature firing is exceedingly strong adhesion to the plate.

The resistors are sprayed or painted through another stencil into their proper places or brushed on with a brush. The resistor paint consists of a conducting material such as powdered graphite, and an inert or non-conducting material such as mineralite or powdered mica. These materials are mixed with a binder to form a paste or heavy ink. The resistance may be varied by varying the amount of inert filler or suitably selecting the length, width and thickness. After the resistor paint has been applied, the plate is placed in an oven at 300°F to cure the resistors so that their values will not change with use. A special resin coating is painted over the resistors to protect them against humidity and other effects.

High-dielectric capacitors are then soldered in their proper positions on the ceramic, using low-temperature solder. For ordinary radio and electronic application, the capacitors are from 1/8 to 3/8 in. in diameter and less than 0.04 in. thick. The new subminiature vacuum tubes complete a typical subassembly.

Uniformity of production, reduction of assembly and inspection time and reduction of line rejects make the electronic printing processes industrially attractive because large reductions in cost are possible. As there are close to a hundred soldering operations in the average household radio set, the cost of labor and materials for soldering alone represents an important item. The new wiring processes should eliminate 30% to 60% of the soldering needed for conventional circuits. A single operator on a production line could conceivably make thousands of printed circuit plates each day.

Plug-in subassemblies made with printed circuit techniques offer advantages not yet fully realized. Such subassemblies can be constructed as integrated units, small, compact, and ready to plug in much like single radio tubes at present. This suggests many maintenance advantages. A repairman might, for example, replace all the subassemblies in a set, returning the old units to a central shop for checking.

● HAVING GOT an OK by membership poll, Seattle Section, AIEE last month started a class to prepare engineers for license examination in Washington. Ten 2-hour evening meetings are to be held weekly. Enrollment is limited to 90, AIEE members having priority. Fee is $5.

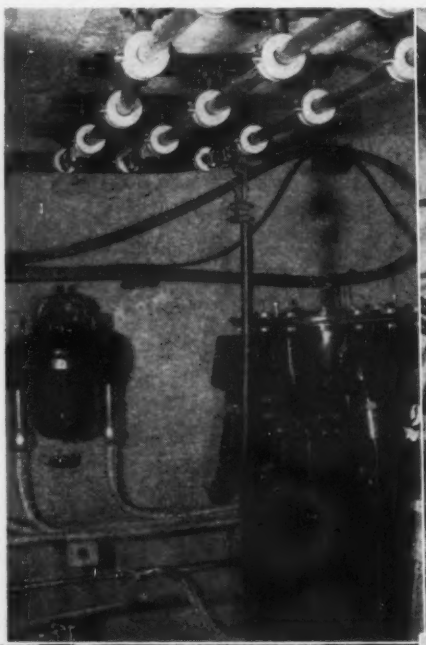
DESIGN OF SECONDARY MANHOLE BUSES FOR USE IN HEAVY LOAD AREAS

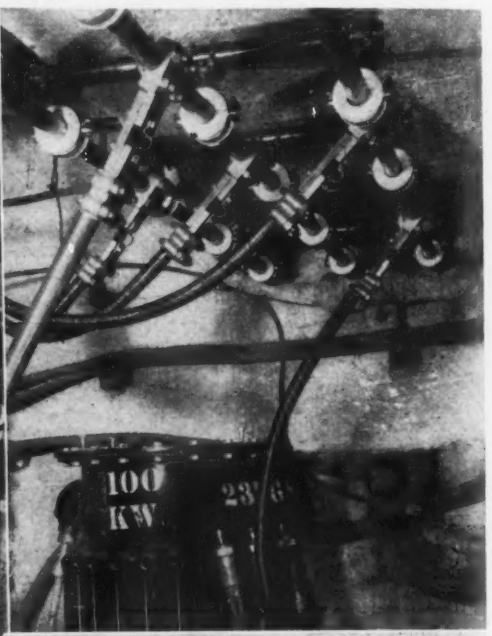
In capitalizing on the economy and reliability of the 4-wire star 120-208-volt secondary network for heavy loads in congested areas, the engineer has a choice of components affecting cost and operation. One such choice concerns the manhole bus, as against the junction box.

In use for years, secondary junction boxes have proved satisfactory where loads are small. But where loads require 1,000- or 1,200-amp. boxes, difficulties arise—overheating, limited space for cable connections, and crowding. Also, boxes must be kept watertight.

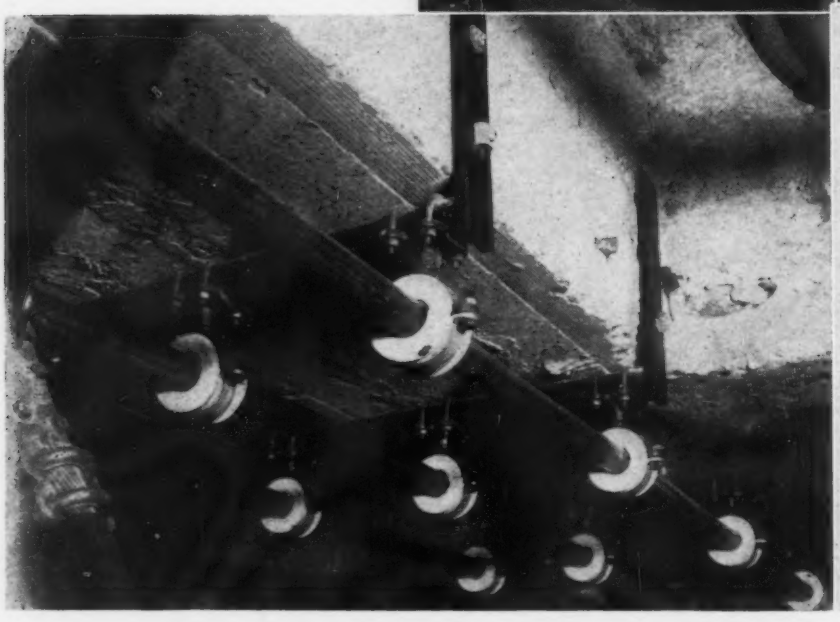
Pacific Gas and Electric Co. has found from several years' experience in San Francisco and Oakland, that secondary manhole buses eliminate these difficulties. A bus provides connection facilities and capacity at least equal to two large junction boxes. It provides far more flexibility for the

The secondary bus used by PG and E as shown below consists of three pieces of 1,500 MCM cable, supported by donut insulators mounted on the manhole wall or ceiling. Usually it is desirable to run the bus the full length of the manhole. Cable insulation is either geon compound or oil-base, neoprene-jacketed combination. Bus spacing and position of the mountings are arranged to provide accessibility for making connections. Another arrangement at right





Connections, made by means of limiters or special fused connectors are shown in the second illustration to the right



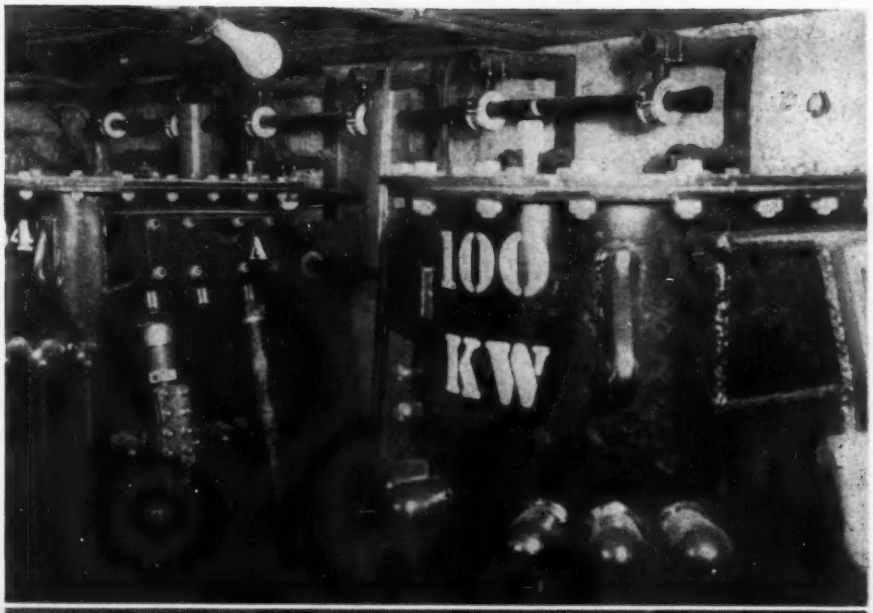
From The PCEA

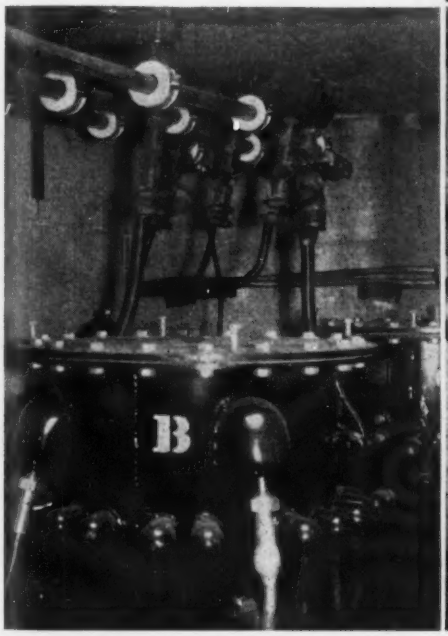
When the Pacific Coast Electrical Assn. met in Fresno, the Operating Economics Section held a panel discussion on experience with low-cost urban distribution. Participating was R. A. Moulthrop, of Pacific Gas and Electric Co. On these pages, with some added details, is the material on which his PCEA presentation was based

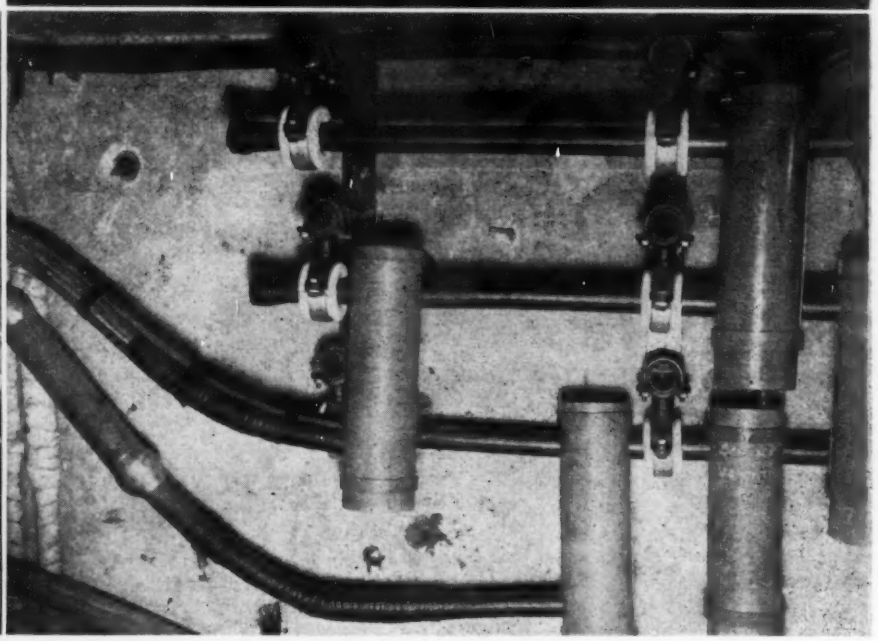
R. A. Moulthrop

connections of services and transformers to mains. It permits making hot connections and eliminates cable splicing difficulties.

As a result, Pacific Gas and Electric has virtually eliminated the use of junction boxes of 1,000-amp. capacity and above.







Above is another view of connections. To make the connection, insulation is removed from the bus at that point, where the connector is easily bolted to the bus making a mechanically strong connection of very low electrical resistance. The other end of the connector is bolted to the lead in the same manner. The connector ends are separated by a piece of micarta, across which is installed a fuse. This appears most clearly in the picture on the opposite page. The connectors will handle very large currents with little or no heating. When necessary, a service can be disconnected, or a main can be sectionalized by removing the fuses. It will be noted that connections are staggered on the bus for adequate clearance in installation and maintenance

Fish paper insulators with which the connectors are covered to confine the arc if the fuse should blow and for safety purpose are shown at the right above

The fish paper insulators, as shown at the top of the page, are 4-in. diam. cylinders, 12 in. long. Each is split longitudinally to form two halves. At the proper point on one straight edge of each half, a semicircular cutout is made to form an opening for the bus. A similar opening is cut at the other end for the lead. The two halves are slipped over the connector, where they are held together by two split rings. Small services or leads for auxiliary manhole lights can be connected by means of a screw lug attached by one of the bolts that hold the connectors to the bus. The neutral and ground wire is a bare No. 4/0 cable, cleated to manhole wall at a lower level

As a result of tests made by PG and E several years ago, and subsequently confirmed in practice, no attempt is made to protect the bus from water. When a manhole is flooded, there is sufficient leakage current to heat the water, but not to do damage. Secondary bus experience covers 8 trouble-free years

SET-UP FOR TESTING

THE testing laboratories of the Department of Water and Power, City of Los Angeles recently completed tests on fuse cutouts for 4,800-volt service. Products of six manufacturers in 50- and 100-amp., 7,500/12,500-Y-volt sizes were tested to determine their dielectric strength and interrupting capabilities. The set-ups required to make the slow-melt and short-circuit tests are of particular interest.

Slow-Melt Tests

Slow-melt tests were made to determine how the cutouts interrupt a current just large enough to melt the fuse link. Current through 50-amp. cutouts was started at 60 amp. and increased 5 amp. every 15 min. until the fuse link melted to interrupt the circuit. With 100-amp. cutouts, current was started at 120 amp. and increased 10 amp. every 15 min. until interruption occurred.

In making up the circuit for the slow-melt tests, we utilized the control and primary equipment of a 1,000-kva., 350-kv., high-voltage testing set. The primary circuit consisted of a 4,800/1,200-volt transformer which normally energized the high-potential transformer through a 500-kva., 0-2,400-volt, single-phase regulator. For these tests, the cutouts were connected one at a time into the 4,800-volt circuit of the primary transformer and, with the high-voltage transformer disconnected, the regulator was connected to a water rheostat for high-power-factor tests and to the primaries of short-circuited transformers for low-power-factor tests. The regulator controlled the current very satisfactorily in both cases.

The water rheostat was a steel, oil-circuit-breaker tank, 8 ft. high, 5 ft. in diameter, and open at the top. Current flow was between a central electrode, composed of two steel pipes in parallel, and the tank. Tap water for cooling was circulated through the pipes into the tank and out a valve at the bottom. With such water flow as was available, currents up to 130 amp. were handled satisfactorily. Higher currents boiled the water violently and caused arcing between the electrode and the water, resulting in wide fluctuations of current. Under one condition with a cutout current of 120 amp., the water-rheostat current was 330 amp., with a voltage of 1,580 volts. The power factor at the cutout ranged between 0.7 and 0.9, depending on the value of current.

For the low-power-factor tests it was decided to replace the water rheostat with an inductive load consisting of one or more transformers with short-circuited secondaries. Fortunately, such a load was available close to the laboratory in a major power station adjacent to the laboratory. It consisted of two transformers from a bank of three, each rated at 10,000 kva., 110/19.9 kv.

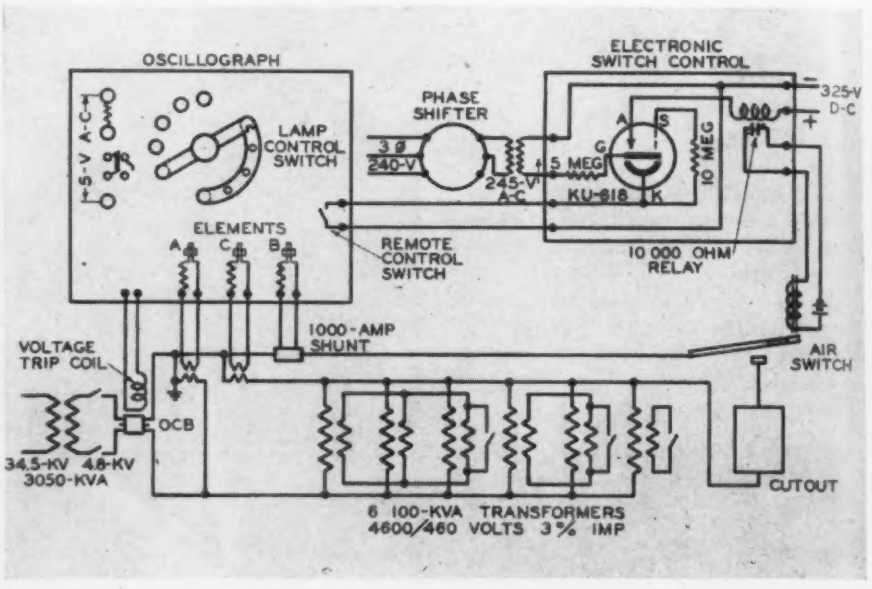


Fig. 1—Diagram of simple electronic circuit used in making short-circuit tests

After disconnecting the bank from service, the 19,920-volt windings of two of the transformers were connected in series to the load side of the regulator and the 110-kv. windings were short-circuited. The connection from the regulator to the transformers was made by running a lead from the high-voltage laboratory to one phase of one of the 115-kv. buses in the switchyard adjacent to the laboratory, and using ground return. With this circuit it was possible to get up to 265 amp. through the cutouts on the 4,800-volt side of the 4,800/1,200-volt transformer. This current was more than ample for testing the 100-amp. cutouts. The power factor ranged between 0.07 and 0.10.

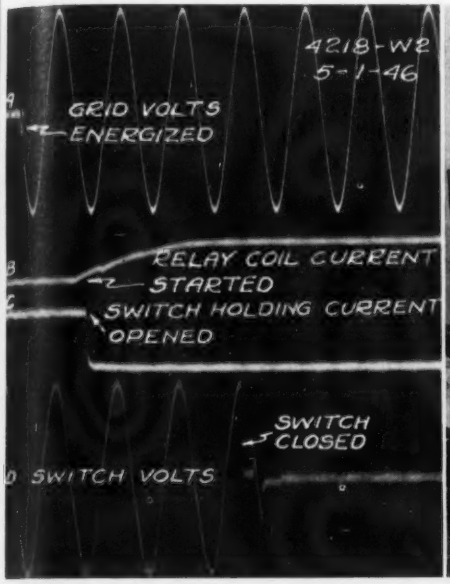
It was found that the currents required by the different cutouts to melt their fuse links varied considerably. Currents for the 50-amp. cutouts with 50N-amp. fuse links ranged between 65 and 95 amp., and those for the 100-amp. cutouts with 100N-amp. fuse links ranged between 130 and 200 amp. Results of tests on any given make, however, were very consistent.

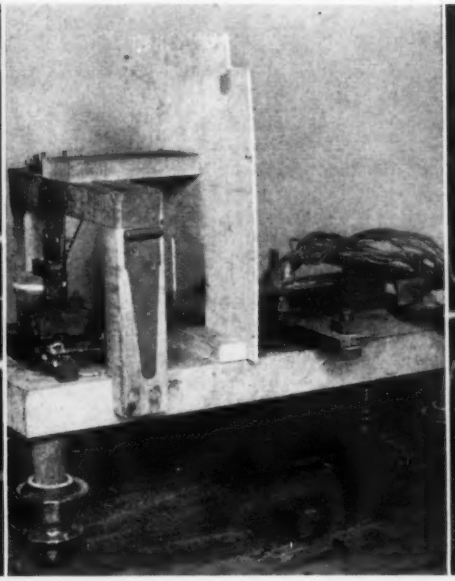
To evaluate the performance of the cutouts when interrupting a suddenly applied over current, oscillograms were taken to record the magnitude and duration of the over current, and a 16-mm. movie camera operating at 64 frames per sec. was used to record the physical aspects of the interruptions. The current was limited by an impedance consisting of six 100-kva., 4,800/480-volt transformers connected with the 4,800-volt windings in parallel in the cutout circuit. It was possible to vary the impedance in six steps by progressively short circuiting the 480-volt windings. The test circuit was supplied through a 3,050-kva, 34.5/4.8-kv. transformer, which was available in an industrial station adjacent to the testing laboratories. With this hookup and without transients, currents of from 700 to 2,700 amp. were obtained. In a few of the tests the current waves were offset and currents in excess of 3,000 amp. were recorded.

To subject each cutout to the same current conditions, it was desirable to make all tests with the circuit energized at the same point on the voltage wave. Due to the construction of the air switch used to energize the circuit, which tended to complete the circuit near the peak of the voltage wave, and in order to simplify the evaluation of the current, it was desirable to energize the circuit on the peak of the im-

4,800-VOLT FUSE CUTOUTS

G. A. Stockwell
Research Laboratory Supervisor
Los Angeles Dept. of Water & Power





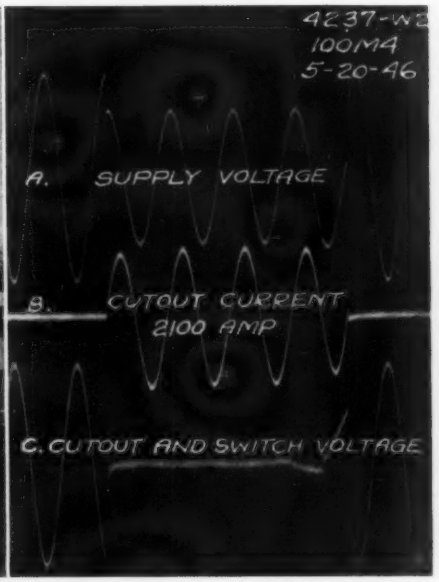


Fig. 2—Control sequence, short circuit; Fig. 3—Switch for short-circuit tests; Fig. 4—100-amp. cutout, 100N-amp. link

pressed voltage. This was accomplished with fair success with the simple electronic circuit shown in Fig. I.

A test was started by manually closing the oscillograph lamp control switch, which initiated a sequence of events to expose the oscillogram, and to energize the grid circuit of the grid-glow tube (KU618). The tube energized its relay to open the holding current of the switch which closed to energize the cutout circuit. If the cutout failed to clear the circuit, the oil circuit breaker opened when the oscillograph completed its record. This was accomplished by energizing the voltage trip coil of the breaker from a step-up transformer connected across the oscillograph lamp-extinguishing switch.

Adjustments

Fig. 2 is an oscillogram taken in the laboratory before the cutouts were tested. It shows the sequence of events from the time the grid circuit is energized until the air switch closes its contacts. The conditions shown in the oscillogram were obtained by repeatedly adjusting the phase shifter until the phase of the grid voltage was shifted with respect to the circuit voltage so that the switch closed its contacts on the peak of the circuit voltage. The adjustment was somewhat tedious, inasmuch as it was necessary to take an oscillogram at each phase-shifter setting until the desired condition was obtained.

A visual indicator would have facilitated this adjustment. One was tried, but it eventually proved unsatisfactory. It consisted of a pair of auxiliary contacts on the air switch, which were adjusted to open when the main contacts closed. These auxiliary contacts were in a circuit with a 1-microfarad condenser, which was supplied through a step-down transformer from the 4,800-volt supply. At the instant the main contacts completed the cutout circuit the auxiliary contacts opened and interrupted the voltage on the condenser. The charge left on the condenser was read with either a vacuum-tube voltmeter or an electroscope. Phase-shifter adjustments were made until a maximum reading was obtained, indicating closure of the main circuit on the peak of the voltage wave. This method seemed satisfactory at first, but when it was used to adjust the closing of the air switch for the actual tests. the circuit was not consistently closed on the peak of the voltage. Tests made later however, when the oscillograph was used to make the adjustment, were quite consistent.

The air switch is shown in Fig 3. The moving member of the switch is an 18-in. arm made up of a contact, an insulating section, and an armature. The contact part of the arm is steel, hinged and pigtailed to a terminal on the base. Circuit connection is made when the arm falls into contact with a steel bar fastened to the base. The switch is held in the open position by the attraction between an electromagnet and the armature which is fastened to the end of the insulating section of the moving member. It is tripped when the current through the coil is interrupted by the contacts of the electronically controlled relay. Contact bounce was minimized by having the armature strike a steel bar on the base at about the same time the contact closed. There was always some burning and pitting of the contacts, so after each test the trip coil was swung out of the way, the moving contact was raised and any protuberances were filed from the contacts. The operating time of the switch was surprisingly consistent, considering that it was first constructed to be operated by pulling a rope. It evolved over a period of 15 years to its present form without major change.

The description of this testing set-up indicates how testing apparatus was combined with available in-service equipment to make high-power short-circuit tests possible on 4,800-volt cutouts. It is such full-scale tests made under controlled conditions that provide the utility engineer with the means to judge what equipment is best suited to his particular power system.

Building Wiring Model 1947

Electrical work on structure built in San Francisco by John R. Cahill displays newest wrinkles in big-scale interior wiring design

Scott Beamer

With Clyde E. Bentley, Consulting Engineer

First large office building to be built in downtown San Francisco since the war is the one at 320 California Street. It goes by no other name than its address. Complete in detail, the 107,000-sq. ft.. Class A building incorporates several innovations in electrical design.

The following list of various electrical data on the building serves to indicate the nature of the particular job and to establish a basis of comparison with other contemporary installations.

1. Service-entrance bus and disconnects are rated 3,000 amp. At 120/208 volts, 3 phase, 4 wire, rated current would be equivalent to 10.1 volt-amp. per sq. ft. over the total building area.

2. The design utilizes high-efficiency bus-duct feeder riser, rated 2,000 amp., in turn equivalent to 6.7 volt-amp. per sq. ft.

3. An emergency or night-lighting system serves stairs and landings, toilets, switchboards, boiler room, etc.

4. Air circuit breakers are used exclusively (except telephone equipment).

5. There is less than 1% voltage drop in lighting branch circuits.

6. Dual floor-duct systems for power and telephone provide free standing plugs, either power or telephone, almost everywhere in the building.

7. Duplex convenience outlets are provided on every column and every 17 ft. 6 in. along outside walls.

8. Telephone raceways along the bases of all walls and most partitions provide unusual flexibility.

9. Parallel push-botton stations allow each ventilating fan to be controlled either from the fan itself or from a central control panel in the room.

Additional details are set forth in connection with the accompanying pictures.

In order to get any job done, the designer must make certain arbitrary decisions. On any job, questions arise which are not susceptible to being answered finally and definitely at the time. And the job can't wait for the answers to become clear. Following are examples of unanswerable questions bearing on the job under discussion here.

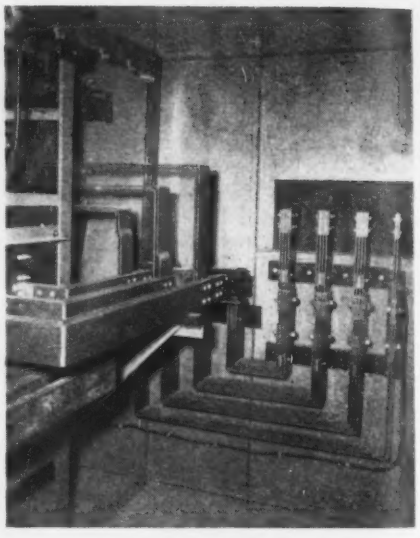
1. Would it have been advisable to spend extra money for a switchboard of high interrupting capacity in anticipation of a Pacific Gas and Electric Co. program for installing high-capacity ring feeders in the downtown streets?

2. Was it advisable to confine interrupting capacity to breakers of 15,000-amp. rating, connected directly to the bus fed from the power company's 500-kva. transformer in the street vault —especially as this transformer is connected into a secondary network?

3. Would it have been better to tap elevator power from the top of the bus duct riser than to install a separate elevator feeder from the switchboard to the penthouse?

On the other hand, every job teaches us some lessons. This one, for example, pointed to the need for a means of keeping under-floor ducts dry during installation; simple enclosures are required to prevent water from entering the duct during the time concrete is being poured and throughout the subsequent period of its curing.

Again, the work brought out the advantage of having an assortment of adjustable rings on the job, so the junction box top may be adjusted accurately to the height of the finished floor.



Inside of switchboard cubicle Entering bus is 7 ft. from power company transformer vault in street. The disconnect switches are rated at 3,000 amp. System to serve till such time as ring feeders are installed in metropolitan area

Feeder system in basement between main switchboard and electric riser shaft. This is first 2,000-amp. high efficiency bus duct in San Francisco. To left of bus duct are conduits carrying elevator, boiler room, ventilating, emergency feeders

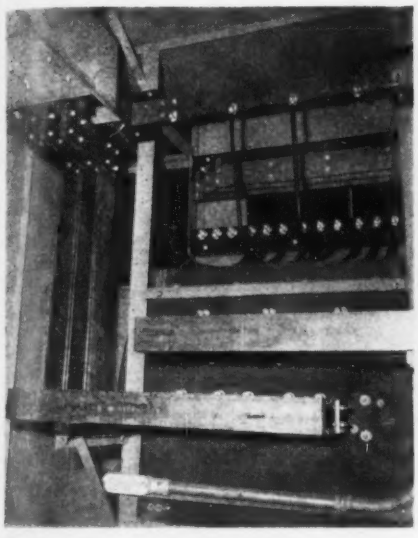
Third-floor installation of Leader "Officer Series" four-tube fluorescent fixtures. Installation is designed for 42 foot-candles maximum, 21 foot-candles minimum

And also, it appears desirable to sectionalize utility shafts so as to prevent conflicts and compromises between the various trades which are making use of the shaft space.

This job is a reflection of current availability of materials and equipment, and of public demand as it expresses itself today. But equipment is constantly being improved, and the public is constantly demanding something better. The electrical installation at 320 California Street might be quite different were it designed only three years hence.

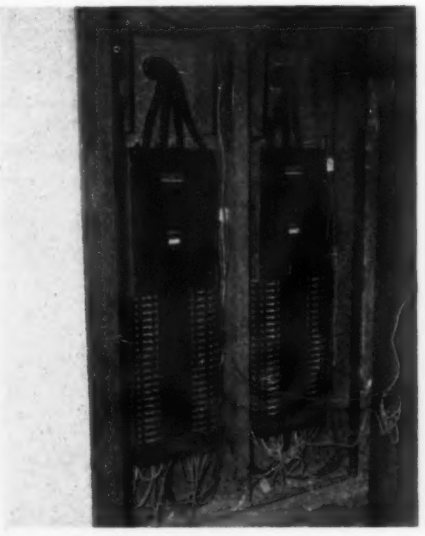
Today, for example, we talk of interrupting capacities. When power company programs for low-impedence, high-density networks in metropolitan areas are well advanced, we may talk of short-circuit stresses instead.

Then there is lighting. Today we think of an installation wherein brightness, color, glare and contrast are brought properly under control as a very modern job. But this involves many fixtures, and for good looking fixtures the customer pays from $50 to $120 apiece. Perhaps it may not be so many years before the fixture is the wall, phosphors incorporated in the wall material are the light source, high-frequency voltage is the source for lighting power, and the same phosphor-impregnated wall is the current



Inside of main switchboard cubicle, showing back of 2,000-amp. air circuit breaker (50,000-rms-amp. interrupting capacity) and two 1/4 x 4-in. copper bus connections between breaker and duct

Looking up the electric utility shaft The two large conduits carry elevator feeders. The three smaller conduits are emergency branch circuit feeder risers. On opposite side is bus duct. L-shaped gutter at center connects bus duct and branch circuit panels. There is a fire stop at every 12-ft. building elevation



The 84 branch circuits for each floor are centralized at one location; thus one lighting feeder serves entire building, but about half the lighting circuits have to be No. 10 wire. Wires go from panels to ceiling in 4 x 4-in. gutter. A special pull box in ceiling connects the conduit system with the gutters. Feeder wires go out back of panel, through L-shaped gutter, directly to 2,000-amp. bus, which is less than 5 ft. away. Conduits at bottom run to floor duct system

path. Research on such equipment is already under way.

Clyde E. Bentley did the mechanical-electric engineering on the 320 California Street building, the following engineers of his firm being connected with the work: Paul T. Regan, Ray Williams, Bob Taylor, King C. Louis, Edward Vollmer, Omer de Bever, and the author.

Electrical contractor was the Pacific Electric & Mechanical Co., with Charles Farros in charge. Grover Stewart was electrical foreman. Design of the building was by Fred H. Meyer, architect. L. H. Nishkian was consulting engineer.

Columbia Electric & Mfg. Co. furnished switchboard and bus duct: Garnett Young & Co. furnished Walker duct and accessories.

HOT FOOT

Concrete floors in commercial and industrial establishments are inherently cold in winter weather. Leg aches, foot cramps, "charley horse," and common colds take their toll, leading to discomfort and lost time. Efficiency of individuals can be increased and production costs cut accordingly, simply by keeping people's feet warm.

Southern California Edison Co. is explaining how this can be done easily with electric heat and has published electric heating bulletin No. 56, explaining how.

A partial solution to the cold floor problem may be arrived at by installing portable wood-slat platforms at work stations, but this does not correct the cause and leaves much to be desired as to result.

In existing plants where floors are already constructed, Edison has found a very satisfactory solution in the use of portable industrial electric heater pads. One southern California organization has entered the market with such units, but general availability is still limited.

It is not difficult, however, for industries to build them in their own shops, and to this end Edison has set forth information concerning the construction of heater pads. It has been an evolutionary process.

Early solutions consisted of nailing lead-sheathed soil heating cable under a wood-slat platform. Gradually this evolved into a metal sheathed heater pad with the cable, as well as thermostatic control, sandwiched between the metal sheets.

Suitable for pad construction is G-E's No. 19, lead-sheathed, Nichrome soil heating cable. Used in 60-ft. lengths across 120 volts it will produce a pad of approximately 450 watts. When hairpinned across the pad on 2-in. centers, such a cable will yield slightly more than 40 watts per sq. ft., which will increase the pad temperature about 40°F, the rise of pad temperature above ambient temperature being on the order of 1° for each watt per sq. ft.

For such 2-in. spacing, sheet metal cut 52x28 in. will work out to good advantage. In dry locations the cable may be terminated in a conduit box in one corner, on the upper side of the top plate. Connection can be made by means of a 3-wire, rubber-covered approved cord, using the third wire for protective grounding through a 3-wire plug and receptacle.

In lieu of this arrangement, cable may be run out of the conduit box through flexible conduit to the junction box on the machine, using the flexible conduit as the ground leg, provided connectors similar, or equal to the "jake" type bushed fittings are used. Two-wire conductors are then used to connect heater cable to receptacle or machine panel.

Where moisture may be encountered, heater cable should be run intact, without electrical connections in conduit box, into the terminal board, and there securely protected against moisture.

Within the pad, the heater cable may be held to its proper looping by means of spacer blocks. Inasmuch as the cable is ¼-in. diam., spacer blocks should be ¼-in. thick and 1¾-in. wide. Operating cable temperatures will be low enough to permit the use of wood, such as wide lath. Metal spacer turn blocks or spools, at each turn, would serve equally well.

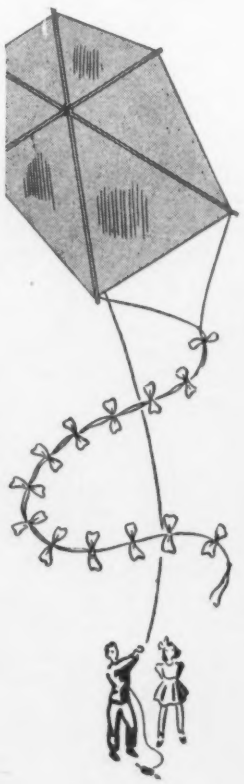
For strength around and between the edges of the entire pad, ¼x½-in. metal straps should be used.

If larger pads are needed they can be built for 240 volts, using 120-ft. cable lengths at the same spacing. This arrangement would properly heat a 2½x8-ft. pad.

Wherever situated, such pads should not be installed until inspection authorities have been consulted.

● NEMA has published its analysis of the revisions in the National Electrical Code in a 144-page booklet, prepared by Arthur L. Abbott, of the NEMA Engineering Department. Copies are available from NEMA, 155 E. 44th St., N. Y. 17, at 50c singly, 30c each for ten or more. Final changes in the 1947 code, made subsequent to the time work was started on the analysis, made necessary an errata sheet pertaining to the latter. Those buying the book should request the errata sheet, which will then be mailed as soon as it becomes available.

How To Make a Kite and Fly It Safely

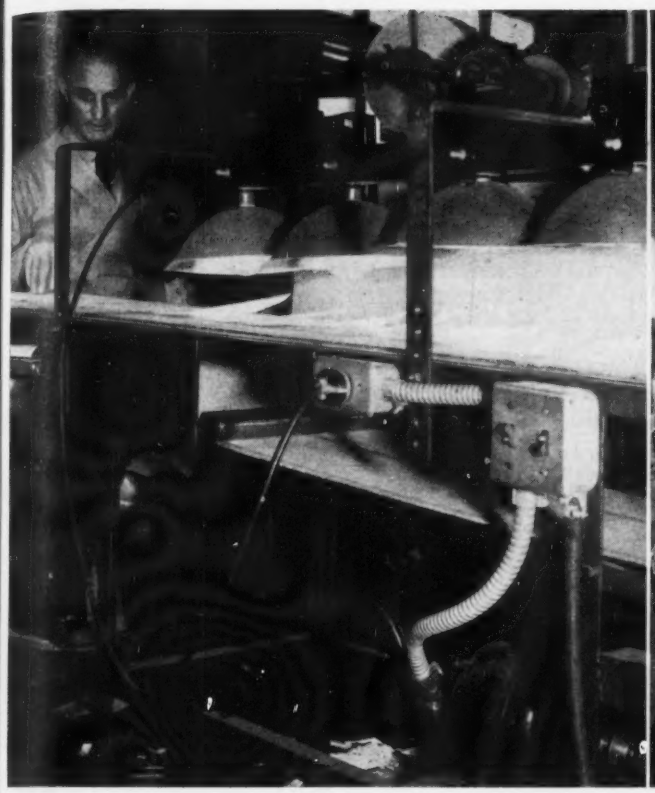


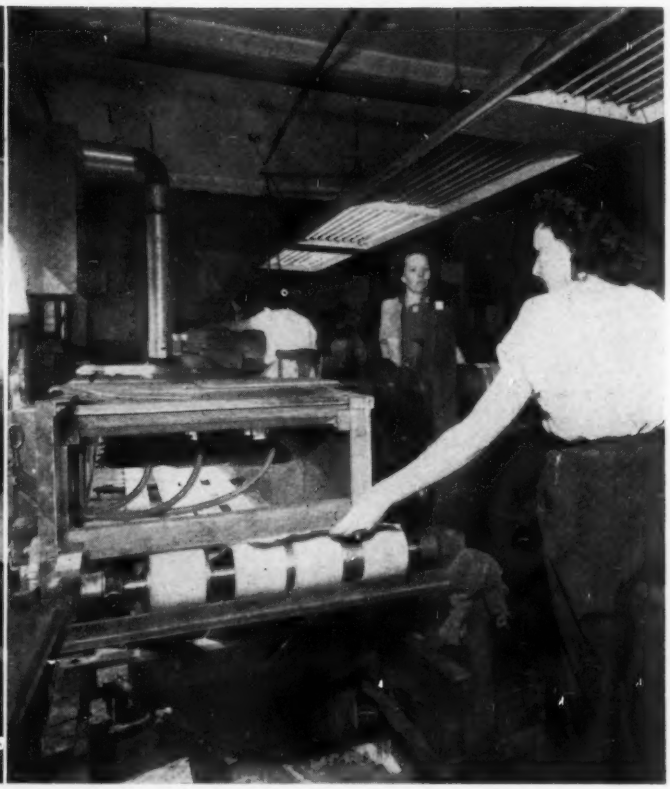
PG and E is pretty sure to win the cooperation of the young kite-flying clan with the booklet being handed out at all offices. Not just a safety manual for mother to wave in a boy's face, this is a snappy little handbook which really shows how to build different kinds of kites and gives helpful tips on flying them.

The rules are there, listed on the cover, and explained inside, but they are not allowed to interfere with the down-to-business instructions on kite building, which are complete with blue prints.

The rules in brief are, never: fly a kite near wires; climb poles; let a kite go over radio aerials; use any wire; use tinsel; run across streets; touch fallen wires, or fly a kite in the rain.

Another edition might keep the talk more plain. Kite flyers aren't too good at words like contemporary, prior, advent, available, represent and ceremonial.





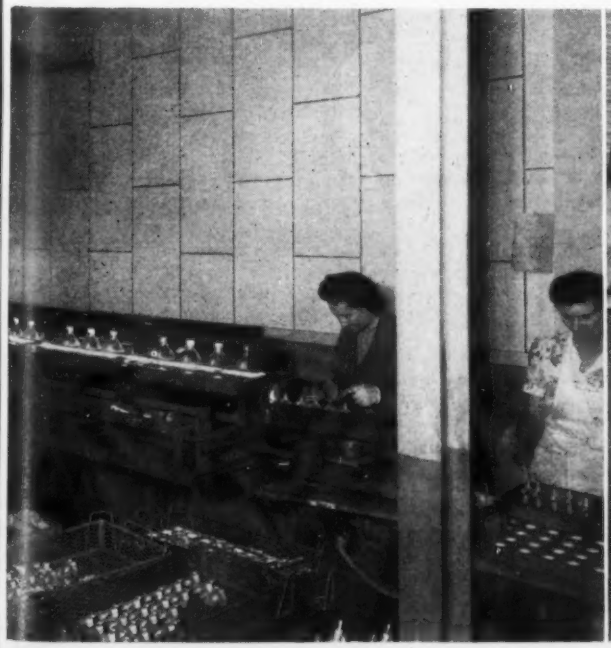
Printers and engravers must let ink dry to avoid offset; Allen & John Engraving Co. cuts drying time by infrared

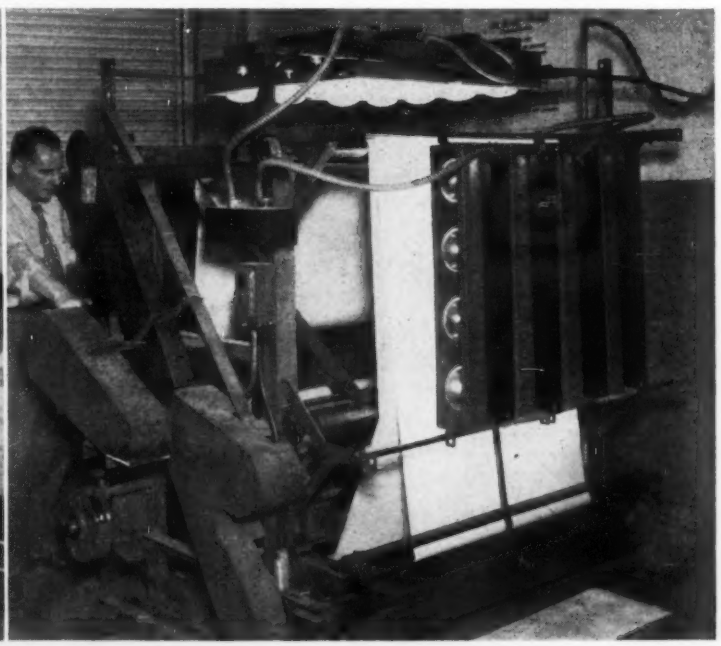
Jeffreys Banknote Co., also Los Angeles, using 10-kw. bank for same purpose; unit flexibility is ideal for small plants

Radiant Heat Speeds Up Small Production Lines

Guetsch Co. got mass-production economy in soldering brass valves by preheating moving line with ten 375-watt lamps

Adaptability to various processes is exemplified by 12-kw. rubber curing machine at Voit Rubber Co., in Los Angeles





Build Your Own Fluorescent Test Equipment

W. B. Kennedy

Pacific Coast Lighting Engineer
Sylvania Electric Products, Inc.

THE ever-increasing importance of the fluorescent lamp has made the electrician a key man in what one authority termed "the third great phase of lighting," which is the planned and proper maintenance of fluorescent systems.

Many electricians, familiar enough with the techniques of installing fluorescent lamps and fixtures, have frequently failed to capitalize on the business potentialities of fluorescent maintenance, simply because they were unaware that this type of maintenance and trouble shooting is an easy task, even though it may appear complex to the users of fluorescent lighting who are anxious to enjoy its benefits without being burdened with maintenance details.

By far the greatest percentage of trouble in fluorescent components involves a lamp which fails to light. Such trouble can be reduced to a simple problem of determining whether it is the lamp, ballast, or starter that is at fault. A simple routine of checking the lamps and starter, in a fixture or test circuit which is known to be operating satisfactorily, will usually be found entirely adequate. A simplified procedure for checking a fluorescent lamp circuit in this manner is outlined in Table I. Electricians who have used this procedure for several years report that it is entirely adequate in all but a few exceptional cases.

Thus, the maintenance man on the job usually does not need any elaborate test equipment, for once he has determined whether it is the lamp, starter, or ballast which is the cause of the trouble, he has simply to replace the faulty element. Many electricians have found it helpful to have certain simple test equipment which can be made in their own shops.

One of the simplest and most useful devices is a dummy or short-circuited starter. A dummy starter can be made from any starter, preferably a defective one, by opening the starter can, connecting the contacts permanently together and then replacing the can. For certain applications, particularly where the starter is mounted under the lamp, it may be more convenient to use a manual starter, which can be made by removing the internal parts of the starter, connecting the two lead wires to the two contacts and bringing them out through the can to an "on-off" switch. When a manual starter is placed in a fluorescent fixture, the switch may be thrown "on" to preheat the electrodes and "off" to open the starter circuit and light the lamp.

Portable Kit

Another on-the-job maintenance aid which has proved invaluable to busy

Table I—When a Fluorescent Lamp Fails to Light . . .

The importance of making sure that proper connections have been made to the line and that voltage is available at the fixture goes practically without saying. If these have been checked but the lamp fails to light, the following procedure may be followed to locate the cause of the trouble:

CHECK THE LAMP. Make sure that the lamp is not defective by checking it in a fixture which is known to be operating properly, or replace it with a lamp which has been checked and is known to be good.

CHECK THE STARTER. If the lamp which is known to be good will not light in the fixture, remove the starter from the fixture and replace it with a starter which has been checked and is known to be good. If the lamp will not light with this starter it indicates that something is wrong with the wiring or the ballast.

Another way to check the starter is to use a short-circuited starter or "dummy" starter with leads from the terminals brought out to a snap switch. When a short-circuited starter is in the fixture there should be a fluorescent glow from each end of the lamp, as during the preheating or starting period. If this occurs it is a reasonably good indication that the circuit is properly connected. If it is possible to start the lamp by quickly removing the shorted starter, it indicates that the original starter was the cause of the trouble.

CHECK FOR POOR CONTACT IN THE LAMP SOCKET. With the short-circuited starter in the starter socket, twist the lamp gently in the lampholders to see if contact can be made. The connections of the lead wires at the lamp sockets should be checked to make sure they are tight. If a combination lampholder and starter socket is used the connection between the two should be checked to make sure that good contact is being made.

CHECK THE WIRING AND BALLAST. If a check on all of the above does not disclose the defective part, the entire wiring of the fixtures should be checked. If this is not defective then it may be assumed that the cause of the trouble is in the ballast, and it will have to be replaced. A continuity check for open circuits, short circuits, or grounds in the ballast, to determine the exact nature of the defect may be made, if desired.

maintenance men is a portable kit for checking fluorescent lamps and starters. The kit, comprised of 14-, 16-, 20-, 30- and 40-watt ballasts, a starter holder, a fixed lampholder and an extension lampholder to accommodate the different lamp sizes, makes it possible to test the various lamps and starters by means of a selector switch which makes the proper ballast connection.

In the maintenance shop, lamp and starter and ballast test boards can be made part of the permanent testing equipment. The lamp and starter test board is simply a board holding lampholders, a starter socket, and a manual starter switch, connected to a suitable ballast. Boards of this general type can be built to check lamps of several different sizes by providing the necessary ballasts and lampholders, properly spaced to receive different length lamps. One holder may be mounted stationary and the other provided with pins so that it can be plugged into jacks located at proper distances to accommodate lamps of various lengths. With this arrangement, connections are automatically made to the proper ballast when the socket is plugged in at the proper distance to receive the lamp.

Filament Continuity Checker

A filament continuity checker, consisting of a fluorescent lamp socket in series with an incandescent socket housing a 120-volt, 25-watt incandescent bulb, may be included in the lamp board circuit. If a lamp does not glow at the ends during the preheating stage when the manual switch is in the "on" position, a filament or coil may be broken. This can be ascertained by inserting the end of the lamp to be checked in a fluorescent filament continuity socket. Failure of the incandescent bulb to light indicates that the filament in the fluorescent lamp is broken.

Starter checks on the test board may be held by placing a good fluorescent lamp of appropriate size and the starter to be checked in the circuit with both the line switch and manual starter switch in the "off" position. If there is a definite glow from each end of the lamp within a few seconds after the line switch is thrown "on," and if the lamp lights, the starter is all right. A short-circuited starter is indicated by the continued glowing of lamp ends without any attempt by the lamp to start. When the lamp neither glows nor attempts to start the starter is open-circuited or otherwise defective.

Ballast Test Board

Before ballasts are installed in fixtures, it is wise to test them in the shop. A ballast test board, which permits quick wiring of a ballast into a circuit to see if lamps will start and operate from it, can be fabricated by mounting a two-lamp circuit on a board, leaving binding posts at points where quick connections can be made. Ballasts of any size can be checked by providing socket spacings for different lamp sizes. To facilitate tracing the connections, surface wiring may be used or lines showing the connections can be painted on the face of the board.

When a ballast has been found faulty, often it is of value to find the cause of failure. For this purpose, a continuity checker employing two ordinary incandescent lamps, operated from a 110-125 volt convenience outlet, may be used. The two lamps, a 7½-watt for continuity and ground checks and a 40-watt for condenser tests, are placed in a parallel circuit with a spot switch to select the appropriate lamp. Two test leads are provided as probes.

Ballast Continuity Check

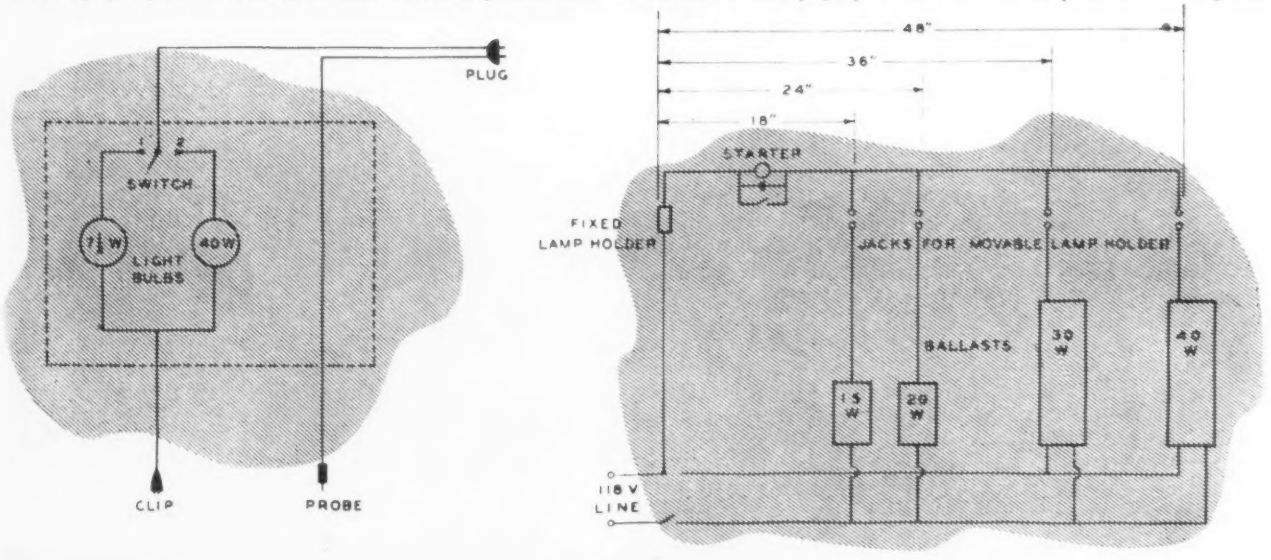
To make a continuity check, the switch is thrown to the 7½-watt lamp, which will light if there is continuity in the particular part of the ballast being tested. Failure of the lamp to light with a ballast combination indicates an open circuit in that part of the ballast. Although ballasts vary, there are always certain combinations of leads which should give continuity. In the case of a two-lamp ballast for a 40-watt lamp on a 110-125 volt circuit, for example, combinations can be found which include the primary of the autotransformer, part of autotransformer and choke coil, part of autotransformer and choke coil plus condenser combination and starting compensator. Study of the circuit diagram of the ballast to be tested will show these combinations.

A ground check is made with the 7½-watt lamp by grounding one of the test leads to a bare spot on the ballast case with the other test lead connected in turn to each of the ballast leads. If the lamp lights with any of these combinations, a ground in the ballast is indicated.

Condenser Test for Ballasts

Condenser test for ballasts used with

One set-up (left) for checking ballast continuity and also condensers, and (right) a convenient lamp-check arrangement



40-watt fluorescent lamps are made with the switch thrown to the 40-watt lamp circuit of the tester. The test leads are connected to outside leads of the ballast to place the choke coil in series with the choke plus condenser combination. If the condenser is all right, it will tend to balance the choking effect of the choke coils and the lamp will light to full brilliancy. If the condenser is shorted, however, the two choke coils will limit the current to such an extent that the incandescent lamp will appear dim. To make this same test on a 100-watt fluorescent lamp ballast, simply substitute a 100-watt incandescent bulb for the 40-watt in the testing circuit.

When working with this tester, however, it should be noted that the two test lead wires are "hot." For this reason, it is recommended that an insulated alligator or insulated battery clip be provided for one lead, so that the operator need hold only one lead during the testing procedure.

Of course, there are many other time-saving devices and short cuts, which the electrician will discover himself, but the equipment described should provide the basic tools for the establishment of a profitable maintenance business in conjunction with the electrician's usual services.

Institute of Light

Once again in operation at Nela Park, Cleveland, Ohio, is the General Electric Institute of Light. Following its recent spectacular reopening, classes, conferences and exhibitions are again available there to everyone interested in lighting, as in the days before the war. G-E put great effort into rebuilding, modernizing and extending facilities, which include nearly every device for studying or demonstrating modern lighting which can be imagined.

Typical is a color room. It is 25x40 ft., with walls of neutral gray and a ceiling of glass cloth, concealing 200 lamps in 10 colors, mostly fluorescent. By various switching combinations color may be gradually changed over the entire room, while maintaining constant illumination level. Colors may also be presented in combination. Luminous charts are provided to indicate hue and saturation.

Then there is the horizon house, which demonstrates what lighting as developed during the war years is now able to do in a home. Built into a representative living-dining room are the fluorescent and incandescent units for a variety of lighting plans, any one of which may be presented individually by manipulating an 80-switch control panel.

Rooms for demonstrating virtually every type of commercial, industrial and business lighting problem are to be found somewhere in the "University of Light."

Safe Decoration

Doing its Christmas shopping early, the California Public Utilities Commission has already taken steps to insure safe decoration for this year's season. A broadside letter has gone out calling attention to violations of rules concerning decorations on or above overhead trolley systems.

Rule 78.3 of General Order No 95 gives minimum safe values as to spacing, clearance, and strength of construction where trolley facilities are involved, and the commission indicates that the alternative to strict compliance will be a complete prohibition of the use of trolley systems for such decorative purposes.

The potential dangers, not only at the site of the decorations, but also throughout extended areas of power or other wire services, which could become energized at 600 volts in event of trolley system contact, underlie the commission's firm attitude.

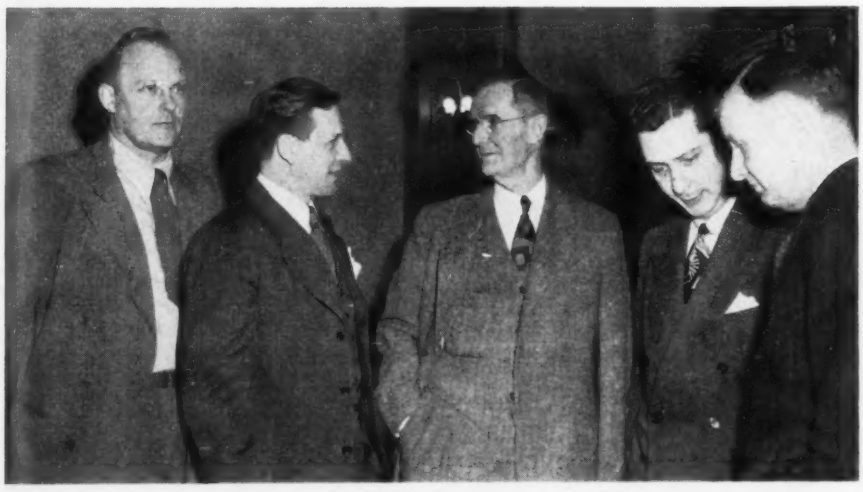
U. of Utah got its stadium lighted in time for night football last season; is now making ready for a series of spring events. J. C. Littlefield and Albert Leick of Utah P&L are responsible for the installation. It gives 20 ft.-candles on the playing field, 25 near goal lines. Enclosed floodlights nearly 100 ft. above field accommodate 108 1,500-watt lamps, operate at 10% overvoltage, yielding 40% more light at 16% more voltage, while reducing life to 300 hr. Together with auxiliary installations for lighting parking area, seats and aisles, load is 275 kw.

● SCHOOLTEACHERS may now get the facts about better lighting from an 80-page manual entitled *Teaching about Light and Sight*, which has been published by the National Education Assn. Designed for instruction of pupils beginning as early as the third grade, the book starts out with the mechanics of the eye, goes on through lighting fundamentals, including measurement, types of equipment and specific problems in the home, suggests a curriculum for teaching proper eye care to students, and concludes with a bibliography. The National Better Light Better Sight Bureau and several other organizations participated in its preparation. Single copies at 30c and quantities at variable discounts are available from the National Education Assn., 1201 16th St. N. W., Washington 6, D. C.

● SOME SIMPLE sample figures on what it costs to light up a store are presented in G-E Lamp's promotion piece, called *pennies? or DOLLARS!* This is part of the 1-3-5-10 planned sales lighting campaign which G-E is pushing hard. The 1-3-5-10 means: 1—15 to 30 ft.-candles for circulation areas; 3—30 to 70 ft.-candles for sales areas; 5—70 to 150 ft.-candles for show cases and shelves, and 10—150 to 300 ft.-candles for feature displays.

United Front Develops from Div. 6 NECA Officers Huddle

They exchange facts and opinions on labor and apprenticeship policies, field activities, dues relations with the industry, pension plan, etc.



Labor agreements and apprenticeship policies, the coming convention of NECA in San Francisco, field men and their activities, dues structures for chapters, relations with manufacturers, wholesalers, utilities, pension plans, escalator clauses, surplus materials sales, fluorescent lamp maintenance, and promotional work for NECA members were chewed over thoroughly in a two-day meeting of the presidents, governors and managers of the chapters of National Electrical Contractors Assn. in the West, held at San Diego last month. It was the first Division 6 conference of this kind, and was called by Vice-President T. L. Rosenberg of Oakland.

Representatives from the Seattle, Spokane, Portland, San Francisco, Sacramento, Northern California, Los Angeles, Salt Lake City and San Diego chapters attended, 50 in all. From NECA headquarters came Laurence W. Davis, general manager, and George Seaman, field director. Present also were the two field representatives for Division 6, R. M. Cook, and the newly appointed C. Fenton Ford. Norman Ferguson, president of the San Diego Chapter, and his group acted as hosts for the meeting.

What Was Done

Labor Relations

An exchange of facts regarding labor agreements in the various parts of the West. A recommendation that the chapters exchange data in regard to labor rates, copies of their labor agreements, copies of individual handling of such problems as traveling time, vacations, mileage, tools carrying.

Apprenticeship

A variety of policies in different locals was found and likewise a variety of ratios of apprentices to journeymen. Necessity of contractors assuming responsibility for indenturing apprentices. The need expressed for the unions to reclassify the wartime permit men, since many are not qualified as journeymen and should not receive journeymen's wage rates. A committee was appointed to study apprentice

Top — Larry Davis, NECA general manager; behind him are George Seaman, field supervisor; T. L. Rosenberg, vice-president; Norman Ferguson, San Diego Chapter president. Center, a group from Washington: R. B. Lane and Kalman Brauner, Seattle; Larry Davis, Larry Gattavara, Seattle, and Paul Heydon, Spokane. Bottom: Ray Carey, Oakland; G. A. Howarth, Salt Lake City; Syd Hill, Warren Penn, Los Angeles; Bob Cook, field representative of NECA for the Southwest

policies and practices, and to recommend a policy for the division.

Field Men—What Are They To Do?

Originally, field men, during the war at least, were most valuable as trouble shooters. Seaman declared that their present work is to organize chapters. Seaman assured the representatives that both field men would be kept in this territory indefinitely, in order to build up the organization. Ford will work in the Northwest, while Cook will work in California and Arizona.

Dues

Dues collection on the percentage-of-pay roll basis was strongly recommended by those chapters which operate under that system. Details relative to discounts on national dues were discussed. Definition of "productive pay roll" upon which dues would be based, it was felt, would have to await determination in working out the details of the pension plan.

Pension Plan

Davis declared further steps on this program await approval by the Treasury Department of exempting such contributions from income tax. When this action is taken, joint committees of the IBEW and NECA will meet to work out details and institute the plan. He expressed the belief that it would be introduced in one area at a time, and only as fast as the details could be absorbed.

Manufacturer and Wholesaler Relations

With the return of civilian business, evils of direct selling to the customers of contractors by manufacturers and wholesalers is beginning to reappear. Policies expressed by the national manufacturers often are ignored through the eagerness of their salesmen in the field. Work on this problem is felt to be necessary, both at the local and national levels, with a demand that a reasonable differential be maintained in prices given in direct sales to permit contractors likewise to sell this business. Responsibility of the contractor to do active sales work was likewise stressed by some of the members.

Utility Relations

Line construction, and even maintenance work, for electric power utilities was discussed from two angles. One was the selling of power companies on subletting the work to contractors. The other was that of getting area agreement with the linemen in order to facilitate the handling of contracts. A special division of NECA is working on this problem. R. B. Lane of the Seattle Chapter is the Division 6 representative on this special activity.

Escalator Clauses

Government agencies refuse to accept bids in which escalator clauses appear. This puts the contractor in an untenable position when manufacturers and wholesalers will not quote firm prices for materials. The manufacturers' problem was appreciated, but the return to firm pricing was recommended as the only way in which contracting could be conducted under these circumstances.

The Government Surpluses

Unsatisfactory experience was reported by all in attempting to buy government surplus material. Policies of the government agencies in calling for bids and then refusing to accept the highest bid and shopping for even higher ones was criticized severely, and NECA headquarters asked to act upon it from Washington.

Fluorescent Lamp Maintenance

Exchange of experience with this was discussed. So far the maintenance contracts and arrangements suggested by lamp manufacturers were reported to be too low to make this a worthwhile business. Close study of costs and of contractor pricing was recommended by those doing this class of work.

The Coming NECA Convention

Davis discussed the plans to bring to San Francisco in September two special trains from the East, starting at Chicago, one through the Northwest and the other through the Southwest. He discussed convention plans and arrangements, and the size of the registration fee in order to cover fully the cost of local entertainment. Likewise discussed was any possible entertainment which local chapters might wish to provide the groups as they pass through their cities.

Extra Governors Meeting

Action was taken to recommend an extra meeting of the board of governors of NECA. At the last convention constitutional changes adopted now require that there be 60-day written notification of any proposed constitutional change. This makes the meeting of the board of governors, a day prior to the convention, powerless to act upon any proposed constitutional changes. Therefore, it was requested that an interim or semiannual meeting of the board be held. Also, suggested was that NECA pay the expenses of the governors. This, however, brought the comment that the cost of this would require increases in national dues.

Likewise recommended was that a division meeting of this kind be held twice a year. Since the convention is to be in San Francisco, one will be held a day prior to the convention, and possibly another late in the year at Portland. Unifying of policies and procedures of the chapters is accomplished through such discussion by the managers and officers. Knowing what is being done and tried in other chapters assists in the handling of the affairs or of similar problems in each local group.

● WESTERNERS appointed to the committees of the National Association of Refrigeration Contractors include the following: finance committee, Ralph H. Baker, Salt Lake City; E. S. Matthews, Spokane; J. F. Park, Los Angeles; labor relations committee, Lee Shirar, San Francisco, chairman; publicity committee, Elton S. Bailey, San Diego; trade relations committee; W. W. Allison, Los Angeles; Charles H. Merrill, San Francisco; membership committee, T. C. Alexander, Denver; A. A. Hicks, Albuquerque; James H. Lessard, Seattle; R. W. Noll, Los Angeles, A. L. Nottingham, Portland.

● RICHARD E. ARBOGAST, Newberry Electric Corp., was elected president of the Los Angeles Chapter, National Electrical Contractors Assn., at its annual meeting recently. Sidney F. Hill was elected vice-president, and A. L. Stone, former president, was elected treasurer. On the board of directors were also named R. F. Doll, R. Max Fry, Jerry Jacobs, Howard Nicholas, Ray Prewitt, and J. B. Shamel. Warren Penn is manager of the chapter.

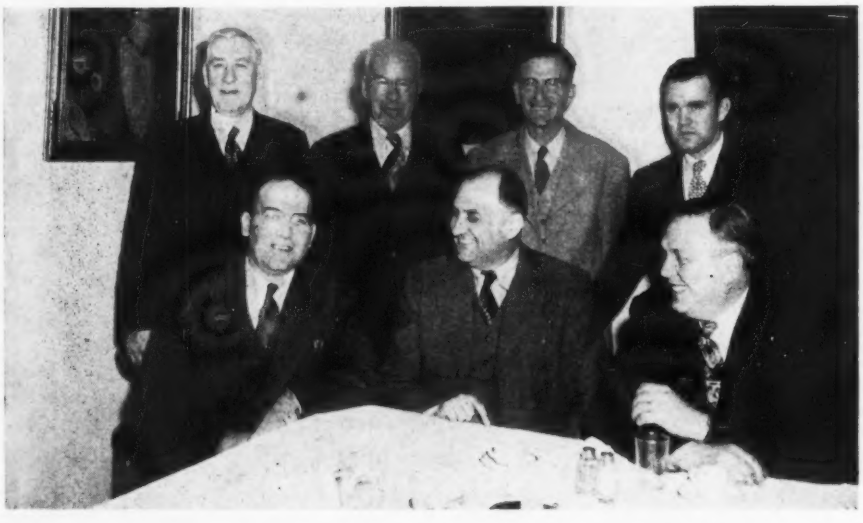
● AFTER a special meeting of the Electrical Contractors and Dealers Assn. of San Joaquin County, held at Stockton recently, that organization asked the National Contractors Assn. for a charter as a chapter to be known as the San Joaquin County Chapter. The Northern California Chapter by subsequent action released the territory at the request of the Stockton contractors. E. H. Grogan is executive secretary of the organization, and J. E. McCarty is president.

● ELECTRICAL Contractors of Washington, a new association, has been formed at Seattle by representatives of electrical companies to formulate a code of ethics and fair practices for the industry. J. H. Hooper was elected temporary president, with T. R. Neilson, first vice-president, Carl E. Fellstorm, second vice-president, Fred A. Engel, secretary and J. E. Atkinson, treasurer.

From Among the Contractor Associations

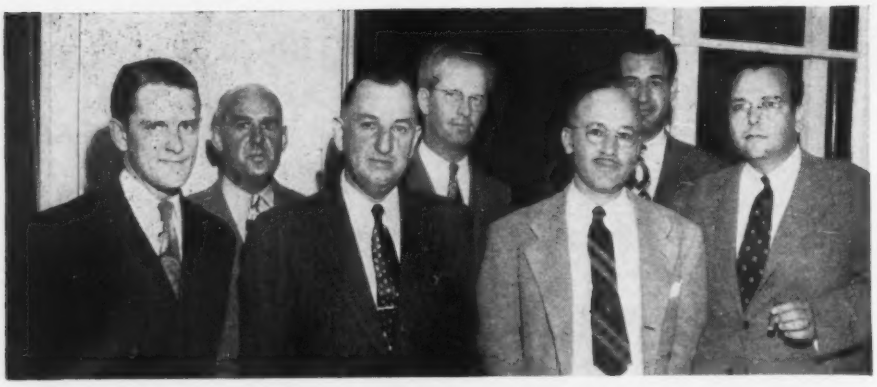
Personalities at recent annual affairs and elections of officers of California organizations

Above: Ray Carey, manager of the Northern California Chapter, National Electrical Contractors Assn., with headquarters in Oakland. His territory covers a large part of that region. At right: the annual dinner of the Marin Electrical Contractors Assn., at Le Chateau, north of San Rafael. At the head table were J. Sablachian, representing IBEW Local 6; Jack Cimino, vice-president; Mrs. Cimino, M. J. Lamperti, North Bay Electric Works, president; W. J. Varley, executive secretary; and Mrs. S. Maoli, secretary



The Sacramento Valley Chapter of National Electrical Contractors Assn. also held its annual meeting for the election of officers recently. In the group at the left are: standing, E. J. Cotter, retiring president; J. W. Thomas, newly elected president; Jack Gray, secretary; J. W. Mapes, treasurer. Seated: W. H. Welsh, business manager; J. D. O'Connor, governor and Ed Wismer, vice-president. Not shown but elected to the board of directors was George Foss, who has the distinction of being the first member of NECA in Sacramento and hence is its oldest member in point of membership. The Sacramento Electrical Contractors and Dealers Association became a chapter of NECA last year

It was the second annual dinner that the Peninsula Electrical Contractors Assn. held last month when its president and treasurer were returned to office for a second term. Shown here are Joe Dingman, treasurer, Redwood City; W. J. Varley, executive secretary, who was presented with a handsome desk set as a gift from the organization for his untiring services; W. F. Klose, of San Carlos, president. With him is Mrs. Klose. In addition to those shown here, Mervyn Mayer, Pacific Electrical & Mechanical Co., San Bruno, was elected vice-president; and as directors there were named: Everett Marshall, Redwood City; William Biber, San Carlos; and E. A. Mueller, also from Redwood City, Cal.



Executive committee of Electrical Appliance Distributors of Hawaii: Doyle Alexander, L. W. Clifford, Otto Ludewig, Paul Anderson, Cletus Chaussee, Charles Cummings and David Wisdom, representing a good cross-section

Hawaiian Distributors

In order to handle problems of mutual interest, elevate the plane of selling and ethics, promote the use of electrical energy and equipment and interchange information for the benefit of its members and the public, a group of 13 Honolulu territorial distributors and dealers of electrical appliances formed what is known as the Electrical Appliance Distributors of Hawaii. Otto Ludewig, of W. A. Ramsay, Ltd., was elected president, Charles Cummings, R. A. Howe & Co., vice-president, and L. W. Clifford, Electrical Development Advisory Service, was made the secretary. David Wisdom of the Pacific Co., Ltd., is treasurer.

For the standing committee chairmen, Cletus Chaussee of Mutual Telephone Co., heads the finance committee; Paul Anderson of The Hawaiian Electric Co. Ltd., the membership committee, and Doyle Alexander, of the Von Hamm-Young Co. Ltd., the program and entertainment. Luncheon meetings, followed by a business meeting, will be held the second Monday of each month.

Bakersfield Meeting

David E. Urner, owner of Urner's Housewares - Appliances - Radios, 2006 Chester Ave., Bakersfield, Calif., was elected chairman of the Bakersfield group of the National Electrical Retailers Assn. at a meeting of the members in the Bakersfield area held in the El Tejon Hotel early this year.

Guest speaker at the meeting was F. J. McDonald, Southern California field director of the association. McDonald, representing NERA officially, outlined the NERA 1947 program of activities, emphasizing the project to secure a minimum 40% trade discount for all electrical retailers.

Plans were consummated at this meeting for a membership campaign to have all electrical retailers in the county become members. All 13 recent new members of NERA were present at the meeting.

H. Witham congratulates Phil Urner

Hot Election

in San Francisco association

In a hotter campaign even than that of last year, the incumbent administration of the San Francisco Electrical Contractors Assn., was swept back into office on a ticket of its own, when the annual election was held last month. Tom Harris was returned as president, Ed. Conroy was elected vice-president, Ed. Dowd, treasurer, and Lou Stolowitz, secretary. Three of the incumbent directors, Carl C. Severin, G. F. Brayer, and H. C. Reid, were returned to the board in addition to B. J. Doherty, W. B. Baker, W. T. Kennedy and Ray Moser. In the clean sweep made by the slate, even some of the usually non-contested offices such as secretary and treasurer were changed. Thus, the veteran George Smith was replaced as treasurer by Ed. Dowd, and the secretary Ed. Scott by Lou Stolowitz. Grant Whittaker, opposing presidential candidate, and Victor Lemoge, vice-presidential candidate, as well as some of the well-known former officers, proposed for posts on the directorate, were defeated in the campaign.

The administration group, although critical of the NECA, at a previous meeting voted continued affiliation and support of the forthcoming national convention of NECA in San Francisco in September. The committee on arrangements for the convention in San Francisco will be headed by William J. Varley, executive manager of the association.

Officers of the San Francisco Electrical Contractors Assn. Seated: Lou Stolowitz, secretary; L. W. Davis, NECA general manager; Carl Severin, director; Tom Harris, president; W. T. Kennedy, director. Rear row: W. J. Varley, manager; Lloyd Flatland, governor; B. J. Doherty and H. C. Reid, directors

PANORAMA OF THE PCEA

Edited by A. X. Schilling

Convention at Riverside

Riverside—where the PCEA came into being in 1917—has been selected as the site of the annual convention, to be held on June 4, 5 and 6. The decision was made at the board of directors meeting in San Francisco on Jan. 23, at which time Albert G. Cage, president of the California Electric Power Co. extended a most cordial invitation to the association to gather for its 30th anniversary at the site of its founding.

In 1917, the group was a division of the National Electric Light Assn., but decided to establish itself as PCEA during that year's convention.

Riverside's Mission Inn has been selected as headquarters, with facilities provided at the Fox Theater, about a block away, for the general sessions, and the Memorial Auditorium, also about a block away, agreed upon as the location for the convention's final evening social events. It is expected that the convention will draw about 500 full-time delegates, with about 300 more attending the sessions and returning to Los Angeles and other nearby cities to spend the nights at home.

In addition to accepting Cage's invitation to hold this year's convention in Riverside, the board of directors pondered other matters during its Jan. 23 meeting in San Francisco.

Considerable discussion was given to the field of reverse-cycle air conditioning, often referred to as the "heat pump" method. It was agreed that the current national interest in this subject would make it worthwhile to arrange a meeting, open to all interested parties, during which the topic would be fully discussed. The meeting hasn't been definitely scheduled yet, but appears likely.

Another meeting that is sure to prove interesting was assured when the board approved the recommendation of the industry information committee that a program be presented to encourage pride in the electrical industry among the persons engaged in it. The program is described below, in the account of the meeting held by the industry information committee.

V. W. Hartley, managing director, reported to the board that his booklet *How Your PCEA Operates* has now been distributed to all members, with extra copies given to members of the membership committee for their use in securing new members. The booklet has been well received and has provoked many favorable comments locally and from interested persons in the east.

Hartley also pointed out that the membership directory now is out of date and recommended that a new one be issued when the present membership campaign is ended. The board approved the issuance of a new directory.

To fill the vacancy created on the board by A. D. Brown's transfer to Washington, D. C., W. E. Cranston was appointed to fill Brown's post as director for the remainder of the term, which expires June 30, 1947.

Industry Information

With Chairman R. G. Kenyon presiding, the industry information committee met in San Francisco on Jan. 22. It was agreed that the committee should proceed with its plans to act as a clearinghouse for various informative and educational material available from sources such as the Foundation for Economic Research, NAM and others, with all such information being sent to Kenyon. Kenyon will then notify all company members regarding the available material, furnishing prices and sources so that company members may obtain quantities for distribution within their own organizations, if desired.

The committee also developed a plan to present a program at a location not yet named and again at the annual convention to foster a spirit of pride among persons engaged in the electrical industry.

The program will consist of: (1) A spectacular demonstration of some of the more recent developments within the industry; (2) a film on Americanism, to be selected from the many such available; and (3) an inspiring closing address designed to create a pride in the listener's job, company, industry and country.

This program was outlined at the board of director's meeting on Jan. 23 by George C. Tenney, and the board's approval was secured for the program's presentation at the convention as well as at a "practice" meeting before convention time.

Code and Ordinance

The technical subcommittee of the code and ordinance committee held meetings in San Francisco and Los Angeles to discuss revisions of the uniform electrical code. Careful study of the National Electrical Code disclosed that the national code now contains many of the regulations formerly incorporated in the uniform electrical code, so that such regulations need no longer be a part of the uniform electrical code.

The new 1947 edition of the uniform electrical code therefore will delete such regulations and will adopt, by reference, the requirements of the National Electrical Code as basic regulations for all wiring installations.

The findings of the technical subcommittee were reported at the Feb. 14 meeting of the code and ordinance committee in Los Angeles, at which G. F. Maughmer, chairman, presided, and the recommendations of the subcommittee were approved.

Membership

The northern group of the membership committee met in San Francisco on Jan. 21, with Vice-chairman W. L. Winter, who has supervision over the northern group, presiding.

To replace A. D. Brown, President Sanders appointed Harold Q. Noack, another southern California member, as chairman with supervision over the activities of the southern group of the committee. Noack plans an early meeting of the southern group to terminate the current membership drive, so that all new members may be included in the next membership directory.

● On Feb. 20, the advisory committee met with the general chairman of the convention, to discuss the convention program and to allocate the available time for general sessions and section meetings, as well the part the sections would take in the general sessions.

IEA Elects

Officers represent all industry branches

John Longden was elected president of the Intermountain Electrical Assn. at its annual meeting last month. Manager of the Westinghouse Electric Supply Co. in Salt Lake City, Longden has been prominent in the affairs of the association. Before joining Westinghouse in 1934 he had been apartment house representative for Utah Power & Light and before that had had experience with Frank Edwards Co., and with J. Henry Jones Co.

E. T. Day, sales manager of the U. S. Rubber Co., Mechanical Division, was elected vice-president; J. F. McAllister, re-elected secretary-treasurer, and Arthur J. Reynolds, manager. The board of directors is as follows: representing chapters, Ogden, H. D. Sparrow, Read Bros. Appliance Co.; Salt Lake retail, E. M. Royle, Royle's Radio & Appliance Co.; Sevier, Joe Buchanan, Buchanan's, Richfield, Utah; Utah County, Henry Heisch, Sears Roebuck & Co., Provo; representing contractors, Jack Jacobs, Apex Electric Co., Douglas Peck, Peck Electric Co., Provo, Arnold Sieverts, Sunbeam Heating & Appliance Co.; representing manufacturers, Morris P. Buswell, Westinghouse Electric Corp., E. T. Day, U. S. Rubber Co., B. C. J. Wheatlake, General Electric Co.; representing retailers, O. R. Bigelow, Paris Co., Clyde A. Davies, Sugarhouse Appliance Co., Edwin H. Hansen, Electrical Appliance & Supply; representing utilities, Ora H. Barlow, Mountain States Tel. & Tel. Co., W. A. Huckins, Utah Power & Light Co., Elmer Jacob, Department of Utilities, Provo; representing wholesalers, Paul J. Devine, W. H. Bintz Co., John Longden, Westinghouse Electric Supply Co., and Howard W. Price, Salt Lake Hardware Co.

Decision to hold an electrical show coincident with Utah's Centennial celebration was canceled after a consideration of all the problems involved in getting the equipment to make an exposition. Instead it was decided to plan such a show next spring.

● About 180 attended the first meeting this year of the Northern California Chapter, International Association of Electrical Inspectors, held last month at San Jose Municipal Auditorium with R. B. Maxwell, chairman, presiding. Ben Hill, IAEI president, now retired, told of his observations and experiences in visiting the various section meetings throughout the country on a recent tour. Kennedy Bliss, Board of Fire Underwriters of the Pacific, was elected secretary-treasurer to succeed Harold L. Gerber who had recently resigned. The meeting was devoted simply to code discussions in which Gerber participated. Questions on the code included those on raceways and branch circuits. Next meeting is scheduled for San Francisco, March 22, a Saturday, during the daytime. This will be an experiment to see whether that time will work out well for the membership attending.

Longden

● Appointments of committee chairmen for the Southwestern Section, International Association of Electrical Inspectors, has been announced by L. O. Trim, Burbank, president. Chairmen of the committees are as follows: articles of association, H. G. Ufer; California state electrical safety orders,, G. E. Kimball; civil service, C. M. Morrison; clearinghouse, R. W. Wiley; code coordinating, F. A. Short; investigation of fires and accidents, H. V. Dobson; legislative, V. W. Hartley; membership, J. L. Ambrosi; ordinance, A. C. Veit; Pacific Coast building officials conference, V. W. Hartley; publicity and public relations, W. A. Cyr; enforcement of standards and regulations, A. I. Benedict.

● An Electric Code class to be instructed by Harold L. Gerber, former chief electrical inspector of the Department of Electricity, is being sponsored by Local Union No. 6 of the International Brotherhood of Electrical Workers in the auditorium of Horace Mann school in San Francisco. It began Tuesday, Feb. 18, and is to be held weekly. Electrical contractors and estimators were invited by Charles J. Foehn, business manager of the Union, to attend and participate.

Inspectors

For the first time in more than a year, the Central California Chapter of the International Association of Electrical Inspectors held a meeting Feb. 15 at the City Memorial Auditorium, Fresno. In the election of officers, L. B. Sterling, city electrical inspector of Fresno, was elected chairman; George C. Lady, city electrician, Merced, vice-chairman, and R. V. Jones, Pacific Gas and Electric, secretary-treasurer. Walter A. Wood, inspector, Visalia, and L. G. Jeffries, Electrical Construction Co., Fresno, were named on the executive committee. Meetings are to be held quarterly, the next one April 5, in Fresno.

Harold L. Gerber, electrical engineer, A. A. Coddington Co., former chief electrical inspector for the City and County of San Francisco, discussed the 1947 edition of the National Electrical Code for about two hours, answering questions and going into details with it. M. Kennedy Bliss, Board of Fire Underwriters of the Pacific, and secretary, Northern California Chapter, IAEI, and Herbert G. Ufer, Western Superintendent of Underwriters' Laboratories, secretary-treasurer of the Southwestern Section, were also present. About 50 attended.

● R. E. Madigan, manager of airport lighting sales, Line Material Co., told the Southern California Section, Illuminating Engineers Society, at its Feb. 5, monthly meeting, the latest developments in aviation lighting, and demonstrated the Bartow high-intensity beacon for commercial airports. A March meeting is scheduled to have D. W. Prideaux of General Electric Lamp Dept. speak on the characteristics and possibilities of flash tubes.

● Theron W. Fitch of Portland General Electric Co. returned from a trip to the East, addressed the Oregon Chapter, Illuminating Engineering Society, Feb. 12, on the subject *New Trends in Lighting.*

● George W. Thunen, Electrical Products Corp., Oakland, discussed cold cathode lighting before Northern California Section, Illuminating Engineering Society, at its January meeting, and Mr. Heitsman of DuPont Paint Co. spoke on paint and light at its Feb. 20 meeting.

Appliance Outlook

NCEB unit also elects years officers

The appliance outlook for 1947 was the feature talk at the annual meeting of the San Francisco Unit, Northern California Electrical Bureau, held last month at the Western Merchandise Mart. W. J. Lee, Sherman Clay & Co., president, presided. B. W. Reynolds, appliance sales manager, General Electric Supply Corp., made a comprehensive and thoughtful analysis of the situation of availability of appliances and shortages of materials, but was not pessimistic about the outlook. He warned that some lines would still be short and on allocation throughout the year, notably the best lines of ranges and refrigerators, but that a buyer's market situation would have to be faced in most instances and active selling resumed. He called it a challenging year, but one which should be interesting to any one willing and able to meet the changing conditions as they occur.

Reports were heard from the various section chairmen. H. Conrad, Shirar Young Co., reported for the Appliance Section; Spencer Clarke, City of Paris, the Radio Section; C. P. McCarthy, P G and E, the secretary, reported for Edward F. Dowd of the Lighting Section, telling of the meeting for Miss Myrtle Fahsbender and the lamp socket selling campaign. Cass Running of J. H. Wiley Co. spoke of the two projects in the Educational Section, one cooperation with other organizations to stop substandard merchandising. Everett Carlson, Central Electric Co., reporting for the Wiring Section, said definite progress had been made to standardize and reduce as much as possible the cost of range installations. The Department of Electricity had cooperated, and two contracting firms were specializing in order to get enough volume to reduce the cost. He urged that all dealers distribute their wiring installations to these two firms in order to realize the best benefits from the program.

In the election of officers, Cass G. Running was elected president, Edward J. Rising, California Electric Supply Co., vice-president, and C. P. McCarthy, P G and E, re-elected, secretary-treasurer.

● SCOPE of subjects covered in the meetings of the Rocky Mountain Chapter, NECA, in Denver indicates the activity of that chapter. Regular membership meetings were held at the offices of the chapter in the Boston Bldg., Denver, to plan and program for the future. Al Stubblefield of the Veterans Administration spoke to one meeting on improving apprenticeship training. Ralph Johnston, chairman, discussed state-wide planning of licensing and inspection laws. Meetings were also held at the Plains Hotel, Cheyenne, and in the Electric Institute in Denver to discuss lighting trends. C. Strain, talked on *Modern Lighting*. Donald Larson is chapter manager.

More Chapters

Additional chapters of the Inland Empire Electrical Dealers Assn. have been reactivated following recent reactivation of the Spokane Chapter.

Most recently resumed after a period of inactivity during the war are the Palouse and Lewiston chapters.

The Palouse Chapter, with headquarters at Pullman, has as its officers: Charles Fanning of Oaksdale, president; Sam Haddock of Moscow, Idaho, vice-president; Loris Winn of Pullman, secretary; Adolph Olson of Pullman, treasurer. Its directors are Paul Helmer of Rosalia, Martin Holter of Pullman, Claude Edgren of Colfax and Eldon Strom of Troy, Idaho.

Carl Harris is president of the Lewiston Chapter, with Ray Harland as vice-president; Joe Fox, secretary; Glenn Bauman, treasurer; and John Nanniga, Art Barnes, John Zinn and H. E. Swedberg, directors. All are from Lewiston.

Canadian Inspectors

Formation of the first Electrical Inspectors' association in Canada was completed recently at Vancouver, and H. L. Taylor, provincial electrical inspector, was elected president. L. H. Miller, Vancouver electrical inspector is vice-president and L. Robson, Vancouver, was elected treasurer. R. Hall, secretary of the Electrical Service League of British Columbia, was named secretary.

W. E. Leppard, Vancouver; D. J. Sanderson, Vancouver; V. Rolfe, Victoria; A. C. Bell, Burnaby; L. A. Hume, New Westminster and Hall were appointed as a committee to draft a constitution and bylaws for the new organization. It was decided to immediately form a study group, and Leppard, Hume, Hall, J. Low, Vancouver; W. Mann, Burnaby, and A. Gracey, West Vancouver, were named as the initial study committee and asked to study particularly Section 512 of the code. It was decided to invite members of the Vancouver Electrical Assn. and other interested organizations to sit in at these study group meetings.

EMEA

"Television—Its Operation and Future was discussed before The Electrical Maintenance Engineers Assn. of Southern California Inc., at its Feb. 19 regular monthly meeting, by R. A. Monfort, chief television engineer of the Los Angeles *Times* television station. The previous meeting had been the election of officers, and Emerson S. Reichard, General Petroleum Corp., was elected president, Henri Ledeboer, 20th Century-Fox Film Corp., first vice-president, Linders L. Warner, Douglas Aircraft Corp., second vice-president, William K. Browning, Gladding McBean Co., secretary-treasurer, and on the executive committee, in addition to the officers, John Zuponcic of Polzin and Zuponçic, John N. Davis, Douglas Aircraft Corp., Homer M. Eversz, McCulloch Motors Corp., Ray C. Gunning, R. A. Reed Electric Co., William H. Slater, Emsco Derrick & Equipment Co. The March meeting was scheduled to have a talk on coaxial cables from a representative of the Southern California Telephone Co., and a talk on power factor by a representative from Westinghouse. The Industrial Electrical Show sponsored by the association is scheduled for March 21-22 at the Rodger Young Auditorium in Los Angeles.

● BRITISH COLUMBIA now has a chapter of National Industrial Service Assn. since the Vancouver Electrical Machine Shop Assn. became a chapter of the NISA. Starting with ten firms, the group has monthly meetings and its officers are C. E. Longley, Longley Electric Co., chairman; G. R. Robinson, Robinson Electric Co., vice-chairman; W. H. Choate, Electric Power Equipment Ltd., secretary; and W. L. Stevens, Stevens Electrical Engineering Co., New Westminster, treasurer.

● AT AN ORGANIZATION meeting held Jan. 29, the Coeur d'Alene area chapter of the Inland Empire Electrical Dealers' Assn. elected George Neilson of Coeur d'Alene, president. Other officers chosen were: Harry South of St. Maries, vice-president; Gordon DeFoe, Coeur d'Alene, secretary, and Glen Shern, Coeur d'Alene, treasurer. John F. Booth, president of the Spokane Chapter, addressed the meeting and outlined the purposes of the association.

ELECTRICAL WEST

Plight of the Colleges

IS there cause for alarm in the staggering numbers of students enrolled in the engineering colleges up and down the Pacific Coast? Or can industry and the profession absorb these new engineers as they graduate over the next three or four years? Educators charged with the indoctrination of these young men are seeking the answers to these questions as they struggle to fit facilities and teaching personnel to classes that are two, three and even five times as large as any previous peaks.

Admittedly there is a crying need for young engineers today. This need stems from the great expansion of industry and construction during and following the war and from the fact that for four years there were no engineering graduates; the youth who might have been were fighting a war. This latter fact accounts for the tremendous engineering registrations in the colleges today. These youths are back making up for the break in their civilian careers.

Here in the West there is every reason to believe that these budding engineers can be absorbed into industry as rapidly as they leave the universities. And based upon present evidence industry will secure a high-grade group of men. Professors report that these returned veterans are making record grades; for studiousness, sincerity of purpose, confidence and maturity they are unsurpassed in college annals.

In the next few months the first of them will be seeking their initial employment. May they receive the consideration and the employment that they merit. In fact it is industry's obligation to see that they are placed. Any other course might lead to future consequences too dire even to contemplate.

Lesson from Britain

FAR as it may be from the Pacific Coast to England, there is a certain lesson this region may take from what is happening there. The almost total paralysis caused by the blackout of electric power is something for sober thought. But more significant even are some of the reasons for such a calamity. Even if certain allowances are made for the weather, the war and the woeful state of the coal mining industry, there is some validity in Winston Churchill's charge: "The brute fact is that Socialism means mismanagement . . . Let us hope the nation will realize from this flagrant example the downward stairway upon which they are now thrust and down which they have descended only the first few steps."

While Mr. Churchill perhaps oversimplifies the situation, nevertheless, the recent paralysis, coupled with the proposed law for nationalization of the electric light and power industry draws attention to the shortcomings of a planned economy. The proposed Electricity Bill creates a state power monopoly which British electric companies, and municipal systems also, say offers no protection or advantages to the public. Centralization and bureaucracy replace the present decentralized units which have proved to be both flexible and efficient. Instead of insuring immediate steps which might prevent a recurrence of the recent crisis and at the same time speed up recovery, the bill tends to freeze existing conditions for at least two years while the takeover is being effected.

Here in the West there are advocates of a planned economy for electric power with its control vested in the federal government. Before listening to the blandishments of such dreamers, the people who would be affected might well study what is happening in Great Britain.

No Discrimination

A CONVICTION is growing in the minds of many business people in the electrical industry that Eastern manufacturers are giving no consideration to the population and industrial growth of the West in the assignment of goods and materials to this region. Because of the acute shortages in many lines, these people think that the system of partial rationing that has been imposed is based upon a prewar set of ratios that are as obsolete today as a horse and buggy.

This contention is groundless. National manufacturers were never more conscious of the accelerated demand from this region and of the necessity for satisfying that demand. Their failure to perform up to expectations is due to conditions beyond their control. Most

EDITORIAL VIEWS

electrical goods and equipment require quantities of copper, lead and steel. These three items are among the most critical. Without them the manufacturers can't build equipment or process supplies for anybody. This situation and not any intent to discriminate, controls the shipment of electrical materials.

As a possible solution to the problem, the suggestion has been offered that "expediters," a special breed of liaison men created during the war, be assigned to Eastern factories. One manufacturer, who has set a fine example in endeavoring to meet the materials requirements of customers in this region, decries such a plan on the grounds that "expediters as such at the scene of production will cause more confusion for their own interests than they can do good."

Only time, material supplies and improved labor productivity will speed up deliveries.

Padre of Light

LEST he slip away unnoticed as humbly as he conducted his work, it is fitting for the electrical industry to pause a moment in contemplation and thanks for the sincere pioneering in light that was carried on by Clark Baker, whose big heart ceased beating on Feb. 20. He had been truly and appropriately named "the Padre of Light" by the late W. L. "Jack" Frost.

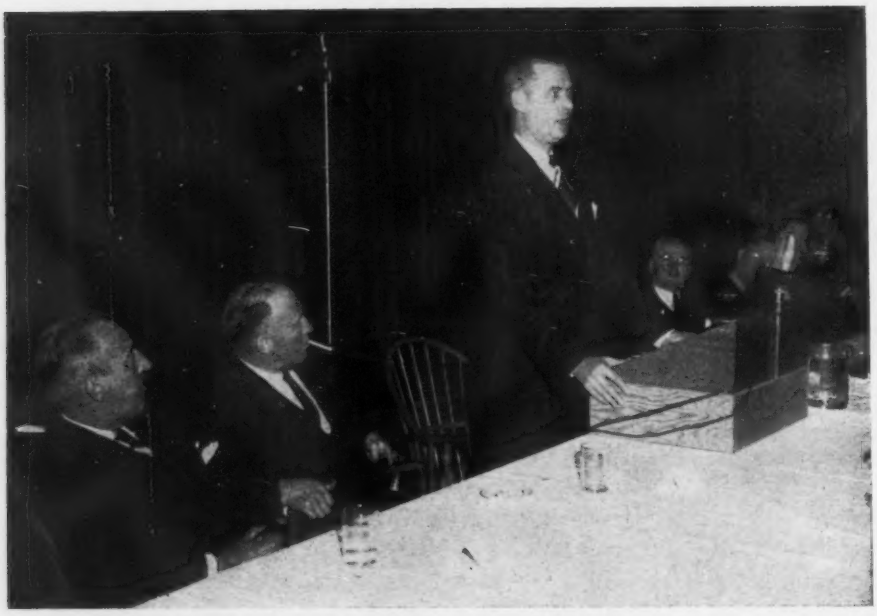
Like most of the prophets, he was a trail blazer, and ahead of his time. Like that of the padres who established the early missions, it was slow, difficult, often discouraging plodding, preaching, pleading that was necessary. Again like their labors, it required a high degree of moral integrity, a painstaking earning of respect.

Clark Baker led a colorful, dramatic life. As a strongly individualistic boy he ran away from home, joined a circus, became a tumbler. This took him from circus to burlesque and somehow into a stage crew as an electrician. Here his interest in spectacular lighting was aroused. It led later to road selling and demonstrations of lamps and lighting for the old National Lamp Works throughout the West. Early in PCEA history he headed lighting committees and turned his zeal and energies to the most important lighting task of all, that of saving the eyesight of school children.

The Northern California Electrical Bureau engaged him as lighting counsellor. He toured the area talking, demonstrating. Many times the progress was imperceptible, discouraging. Many times those supporting this pioneering questioned its worth. Most difficult of all, slowest, was earning the acceptance, then the respect of the cautious medical profession and the equally fearful school authorities. But his sincerity and his absolute honesty of purpose won both.

To his associates Clark Baker had become so familiar a figure that he was taken for granted. It was he who brought lighting knowledge to the union electricians and apprentices at their own request. It was he who initiated the establishment of recommended practices for school lighting by the State of California school authorities. He led the way with light.

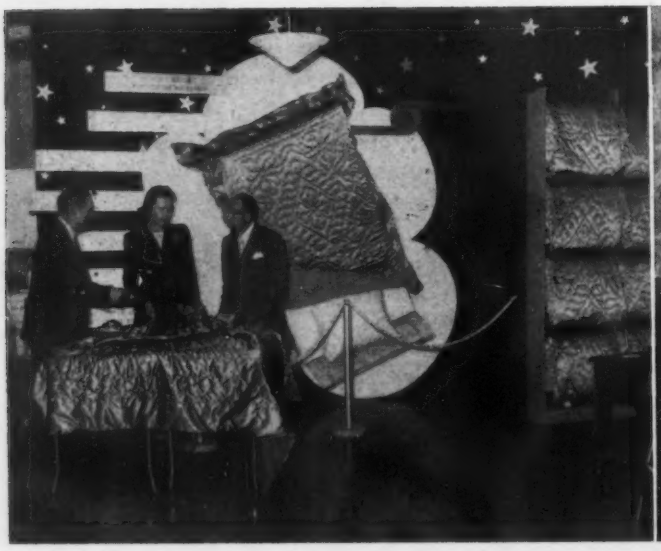
WE are going to stick to the only formula we know. That formula is this: When you make a better product than your competitor's at a lower cost, people buy your product—not your competitor's. The lower the price of your product, the more the number of people who can afford to buy it. And the more of your products you make, the less each one costs to make—and the more money you earn to buy better machines so that you can pay higher wages and learn how to make things still better, at still lower cost . . . America, in our opinion, is on the road back to economic sanity, and in the healthy competitive market just ahead, our customers will demand more and better products for their purchasing dollar . . . Prices are too high today. The way to get prices down is to get costs down and produce more . . . In our quest for ever-lower costs, we are turning to the great industrial community of the West Coast, with real confidence that its resources of productive skills and managerial ingenuity will have an increasingly important contribution to make to our success and to the success of the American Economy.—Henry Ford II, president, Ford Motor Company.



Yes, it Was

J. W. Stigall, Launderall sales manager told the 1,200 dealers at the appliance dinner that the market for automatic washers had hardly been touched. At the speakers' table also were George Tenney, R. E. Fisher, chairman; Frank Runyan, Carl Sorby, the other speaker

Below, left: Westinghouse spectacularly displayed its new electric comforter. Ralph Sorenson, Mansfield, Lois Ferris and Spencer Clarke, City of Paris. Right: General Electric Supply showed farm electric equipment to dealers. John Keane of G-E Supply and Jack Grimes, San Francisco dealer, at right



Below: Hotpoint's Howard Scaife shows Logan Hatch of Redding the dishwasher's action; Art Nerling assists; Bill Harvey, Graybar, Clarence Johanson of Fortuna, and Blaine Lind of Graybar look on. The kitchen was Hotpoint's latest

First time shown anywhere was Nesco's new aluminum electric heater. Carl Hagstrom, General Appliance, San Francisco dealer, signs first order with W. E. Derbyshire, Graybar. Helen Norris dunks one. Cliff Russell one of designers

Quite a Show

So fast do things move these days that the winter market week in San Francisco already may be considered old stuff before the long-time-it-takes-to-print-anything these days allows ELECTRICAL WEST to report it. Fortunately the high lights were caught and broadcast in last month's *Newsletter*.

There remains then a kind of digesting to do of it all, a bovine contemplation while masticating it over slowly, like cud. For it was a pretty nourishing kind of a market. Many of the 6,000-odd dealers and buyers which Western Merchandise Mart reports were registered caught some of these significances. Others probably were too busy. Naturally none of those who could not attend did, and it is for them that an appraisal of it is attempted here.

Appearance-wise it was more like old times. The displays were well stocked. There were many new things to be seen and demonstrated. Things long promised and written about were actually there to be seen, touched, tried and therefore judged.

There was a return of the buyers' critical questioning and appraisal. It wasn't just, "When can we get some," although that was laughingly asked too. The answer was cautious but more hopeful. Shipments are arriving oftener. New lines will be sampled soon.

Automatic washers drew the crowds. For the first time many of the long-heralded makes were to be seen in action, could be compared. ABC-O-Matic, Apex, Blackstone, Launderall, Laundromat and Bendix the pioneer, were all sloshing clothes around in suds while their demonstrators gave the "pitch." Bendix, however, was proudly displaying its new deluxe ironer and dryer.

Since appliance lines are franchised

Automatic washers at the show. Top: Mary Ellen De Wine, Bendix home economist, demonstrated the new ironer to a group of home economists. Dryer at the right. Next: Barney Clauson, right, shows Mr. and Mrs. A. A. Quadros and Mrs. J. P. Marshall of KND Washer Service, Oakland, the new Thor sink combination. H. W. Altorfer, himself, in the center, next picture, shows Lewis Caple, Antioch and Mr. and Mrs. F. G. McNally, Vallejo, the ABC-O-Matic. Bottom: A. C. Scott, Apex sales manager, brought L. D. Stull the first Apex automatic washer to be seen West of the Chicago market

At the Los Angeles market: U. S. Grant Supply Co., one of the growing number of appliance distributors, showed packaging of frozen food to visiting dealers. Above are U. S. Grant, Lanetta Logan, and T. J. McIntire, Yorkville Paper

up to their ears, with back orders stacked from past markets even, buying in the appliance lines could not reflect activity, except in a few brand new items, such as electric lawn mowers, dairy and home milk sterilizers, previously unseen lines. In the gift, housewares and toy market, which followed the main show, buying was slow but satisfactory, Kay Leber, that market's impresario announced. The Mart's release indicated the same was true of furniture and floor coverings.

Kernel of what the speakers at the furniture industry and the radio and appliance trade dinners had to say was important. An insight into what it is to operate under socialist controlled economy was given in an uncomplaining but vivid personal picture of postwar England by Sir Herman Lebus. London furniture manufacturer, at the first dinner. Because of desperate fuel shortages manufacture is permitted only by government permission, for distribution to an area close to the plant, and according to styles and specifications issued by the government only. Purchasers are issued coupons upon a showing of need. It is really controlled distribution.

James I. McMahan, Santa Monica owner of a chain of furniture stores in California, advocated better study of his costs of doing business by each dealer, saying it is not realized that it costs about $8 per customer for a salesman to walk to the door to greet one and $13 to take the time to sell the customer. His opinion was that furniture would take more of the public's disposable dollars than other retail lines (85 to 90%), appliances 15 to 20%.

Everybody but George C. Tenney, editor of ELECTRICAL WEST, talked about the buyers' market. Tenney paid an eloquent tribute to Thomas A. Edison, the man who really started all this appliance business by his pioneer inventions and discoveries. This was at the appliance dinner, at which R. E. Fisher, vice-president, PG and E, was chairman.

J. W. Stigall, erect young sales manager for Launderall division of F. L. Jacobs Co., Detroit, told the appliance dinner crowd of more than 1,000, that with about 59 million people employed there is purchasing power, and with a needed 15 million new homes, a market, to say nothing of replacements, for washing machines. Only 800,000 automatics are in use, so the market is not even scratched.

Everything that E. Carl Sorby, vice-president of Roper Corp., makers of gas ranges, said about the gas range in his dramatic, illustrated (with cutie live models too) inspirational sales message, applies even more to the electric range. The gas industry's highest imitative achievement, the C-P, is still a gas range. But from the advertising that the gas industry is doing, which Sorby flashed on long streamers, the public is going to be told aplenty about that product. The gas attack is going to be strong and long. It was a challenge to the electric appliance industry for a competitive bout of super proportions. At a press conference Sorby was proud that a "thousand dollar gas range" has been shown at the Chicago market. The gas range industry is definitely after the class as well as the mass market.

Accompanying pictures, only a sample of many more taken but all that space will allow, show many of the new things displayed. Many just as interesting cannot be shown. Between this condensed digest and that in the February *Sales Guide Newsletter* an idea of the value of attending such a market is offered. The invitations and statements emanating from Frank Runyan, Western Merchandise Mart president, and George L'Amoreaux, promotion manager, while true, may be considered naturally favorably biased by dealers of the West. But when a veteran of markets and a keen observer of merchandising like J. Clark Chemberlain, manager of San Diego's Bureau of Radio & Electrical Appliances, says what follows, there is real value to a dealer to attend. In his last bulletin to members Chamberlain said:

"I am now convinced that this market will challenge the interest of many who have made the practice of going to Chicago for similar showings. Our Western markets may not rival the Chicago affairs in point of volume or even variety of products shown, but it is probable that many who have been making the difficult and sometimes disagreeable January trips to the Midwest may discover that attending a Pacific Coast showing such as this one just concluded might prove a much more pleasant experience and just as profitable."

● LITTLE GIANT INC., Hayward, Calif., was elected to membership in the American Washer and Ironer Manufacturers' Assn. at the organization's recent convention in Chicago. Kenneth F. Keefe, president and Gerald D. Hecker Jr., vice-president and general sales manager, represented the company at the meetings and accepted membership. Little Giant has been a Western manufacturer of washing machines for more than 20 years and recently built a new plant at Hayward to meet increased demands.

Keefe and Hecker

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ELECTRICAL WEST Sales Guide

NEWS LETTER FOR THE ELECTRICAL MERCHANT OF THE WEST

March
1947

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How are things?

etter shipments lately in all but the deep southwest, in rizona, New Mexico and way points. The rest of the West has een getting its share of the total output and as freight cars ave been more available, more of them have been loaded and de- ivered to distributors. The sheet steel shortage is still a- ute, so that what there is of it is going into the most needed ppliances, and new models or added lines are still in the romise stage.

Many meetings

here has been a rash of distributor and some dealer meetings o show the 1947 lines. The gadgets are coming back strong. efrigerators and ranges both are deluxed with control features, ye-catching trim details and added service stuff. Refrigera- ors provide more frozen food storage. Ranges all have more re- ponsive and more versatile control of heat.

Price resistance

he public is showing its disfavor of some of the new prices. aybe not to dealers so much as under-the-breath and in private onversations. It is having its effect on those waiting lists. nother checkup of them would be to any dealer's interest. When he desperation market is used up the replacement one may be ard to sell.

FM comes in

ore FM stations are coming on the air. Eitel-McCullough's sub- idiary, "Radio Diablo" KSBR at 97.7 Meg. runs experimentally very weekday from San Bruno to the bay area. KFMB in San Diego wned by Jack Gross will be on the air in a week or so. KSL and he Intermountain Electrical Assn., in Salt Lake held an FM eeting Feb. 24 to tell of the local situation.

Price break

merson radio broke with the first price drop on portables. ook $10 off its popular portable, or 25%. Hopes to get more olume so that it can get better prices on components itself.

Dated

an Diego Bureau of Radio & Electrical Appliances has set Monday, une 2, as the date for its spring conference. The date per- its some big names attending the PCEA meeting at Riverside, une 4-6, to come early and attend both. A big FM meeting is lso planned when the new station KFMB goes on the air in March.

Hot stuff is cooking at Hotpoint, some of it still not ready to dish out. Leonard C. Truesdale, recently of Bendix Radio and before that Frigidaire, will become vice-president and director of marketing, according to J. J. Nance, executive vice-president. Other things in the wind promise more water heaters soon, a new range with some entirely different features, a refrigerator that gives interior space of an 8 in the size of a 6, a new water heater design in standard cabinet size. There'll be an automatic washer later this year too. Howard Scaife, western manager, plans product showings in Portland, Mar. 24-25, Los Angeles Apr. 1-2, Salt Lake City, Apr. 7-8. Greg Reece, range sales manager will be out.

Hot news

Installation costs are plenty high, what with high wages and poor efficiency, but they are threatened with another hike. Fresno electricians struck and got $2.15 an hour. Now all the other western locals are asking for more as wage agreements come up for renewal. It will all reflect itself in the cost of installing ranges, water heaters, kitchens, and home wiring.

Wages raise costs

Celebrating a year of remarkable growth, the Southern California Radio & Electrical Appliance Assn. holds its annual dinner Mar. 6 at the Ambassador, Los Angeles. Editor George Tenney of Electrical West and Dr. Paul W. Ivey, USC. are the speakers. New president D. C. "Chal" Culbreath takes over from Robert Cockfield, who has fathered the organization from infancy to sturdy boyhood. Organization now has 279 members, 222 of which are retailers, says manager Bill Quinn.

Husky young

You should be able to make good sales talk of the fact that the National Business Show in San Francisco last month certainly showed how important business considers electrical labor-saving devices. Nearly everything shown was run by electricity, especially typewriters. The little woman in the home is entitled to electrical help too, if the office is.

Office vs home

For places where the water pressure is low and gives trouble on the timing cycle of automatic washers, Bendix has a suspended timer kit, which holds back on the motor 'til the tub is full.

Stops time

An electric milk house heater is announced by Cliff Russell, for Electromode Corp. It is Electromode's small industrial heater with the built in high temperature shut-off and cast-in-aluminum heating element that guarantees shutting off should inflamable material, such as hay, get close to it. Operates on 220 volts; 3,000 watts.

Milk house heater

Remind-O-Clock is a new electric clock made by James Clock Mfg. Co. at 5307 E 14, Oakland, that can be set to buzz and remind as many as 48 times a day. Has a lot of uses in business and industrials, schools and hospitals, etc.

Buzz me !

Schuyler-Wilson Co., distributors of such lines as Federal radio, Young washers, Empire portable ironers, Knapp-Monarch products and other housewares, has moved into new office, warehouse and shipping headquarters at 324 Fifth, San Francisco, according to Jerry Schuyler. Display is still maintained at the Western Merchandise Mart.

Expand

First with its wiring booklet, Westinghouse is also first with a series of manuals on electric home planning. The first one, "Planning the Kitchen Electrically" is now available. Other rooms will be treated in subsequent manuals.

Kitchen manual

By the way, although Westinghouse's west coast headquarters offices will be moved soon into a newly remodeled building on Bush street in San Francisco, the merchandise division will continue to headquarter at the Western Merchandise Mart.

Stays in Mart

Frigidaire showed its five new electric ranges at a series of dealer meetings beginning at Salt Lake, Feb. 17, including Seattle, Spokane, Portland, Los Angeles, Oakland, and ending at Billings, Mar. 5. R. G. Hutchison, regional manager, from San Francisco and Fred W. Beecher, regional appliance sales manager, were assisted by local distributor men in each meeting. The emphasis, said R. E. Robertson of Oakland, where 452 attended, was that "its time to get to selling."

Revival meetings

The Frigidaire ranges have been redesigned, have simpler controls, bigger clock, more insulation, a single double width drawer on roller bearings in the deluxe two-oven range and a new lamp design.

New ranges

Wm. C. Miles has joined the executive staff of D. F. McCormack & Co., distributor in San Francisco as sales manager of the record and radio division. Bill Miles spent many years with Westinghouse appliance division, and Westinghouse Supply. Recently he was with Stromberg-Carlson.

Music

Boyd Distributing Co. of Denver is the newest exclusive distributor for Proctor in the states of Colorado and Wyoming. He was appointed recently by Cliff Ivy, Denver district manager.

Mountain area

Easy's little apartment washer, with the spinner basket, the Whirldry, will be reaching the West in some quantities within 60 days, Fred Fenton, western manager, hopes. The San Francisco market area will get them first, then in turn others.

Apartment special

Hoover vacuum cleaner now offers a complete kitchen closet in which to store the cleaner, all the tools, all other cleaning materials and tools, even to a stool and wash basin, in a streamlined cabinet to fit into any kitchen modernization.

It holds everything

With its new automatic washing machine as the headliner, and a new line of super ranges, "spacesaver" refrigerators (6 cu.ft. in the space of a 4, 8 in that of a 6), a new water heater with a wrap-around element and other new things, General Electric will spring a series of dealer meetings. Its distributors were given the first peek earlier. In San Francisco it will be G-E Supply which does it, Bert Reynolds, impressario, Mar. 11-12. R. C. Paget of G-E Supply will handle in Portland and Seattle, Mar. 17-18. Valley Electrical Supply will hold many small dealer meetings in the San Joaquin Valley. E. A. Thomas of Arizona Wholesale Supply will stage a Phoenix meeting. In Los Angeles Steve Maher and George Lloyd will double the bill with the opening of a new building for G-E Appliances, Inc. about April 1.

G-E showings

Maker of the Durabilt automatic folding iron, Winstead Hardware Mfg. Co. now has an automatic light weight iron (3 lb.) with a low contour and thin beveled sole plate which contains the heating element. D. E. Sanford Co. distributes it. — Slim silhou

To adapt any phonograph pickup to any radio, D&M Mfg. Co. of Midland Park, N.J. has a Phono Occilator, which in effect broadcasts the record to the set at any distance up to 50 ft. and blankets radio static. It uses only one tube, weighs 12 oz. can be tuned to a chosen frequency. — On any set

Rejuven-Air, a radio, not a ventilator, is Electromatic's new portable radio in leatherette carrying case to sell at about $44. — Portab

General Aviation Equipt. Co. has appointed D. E. Sanford Co. as national sales agents for its Wilkes hot plate, equipped with two 400-watt elements in each of the two plates. — Hotpla

Motorola has announced four new short-wave and standard band radio sets suitable for use in even tropical latitudes. They have been moisture and fungi-proofed. — For tropic

A combined heating element and temperature control, being made by Acme Laboratory Equipment Co. of New York, has lots of possible uses--such as heating fish tanks, sinks in soda fountains, photographic tanks, etc. It has critical temperature control, comes in several wattages. — Tank heater

Sunbeam has a new hedge trimmer in a light weight plastic housing, employing a 110-v. motor, to retail at $34.75. — Hedge trim

Rittenhouse Co. has a new King Edward door chime that can be fixed to play different tunes for front and back door and "a novelty tune appropriate for party nights." — Musica

Toadroy Mfg. Co. of Wellington, Kan. has brought forth an attractive "whirling friction" floor polisher with streamlines and light weight. — Floor polish

Howard Industries of Chicago has brought out a combination electric heater and fan in which the fan is set on the vertical in a compact circular case, incorporating a cone-shaped air deflector. — Heat fan

Hallicrafters has shown models of a new 4-lb. two-way radio portable in a shoulder strap leather carrying case, which is said to have a range of 7 miles. — Two-way

Jacobs Launderall and Bendix Home Appliances are in a suit brought by the latter, charging infringement of patents. Both companies have issued statements. Jacobs contends it considered all Bendix patents and avoided them, developed a commercial laundry washer of its own. — Automa suit

An important case up before the Federal Trade Commission may have a repercussion on appliance demonstrations. Coty, Inc. is accused of voilating the Robinson-Patman Act in its use of factory paid demonstrators in stores to push its product. — Watch this

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ELECTRICAL WEST
Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © March, 1947

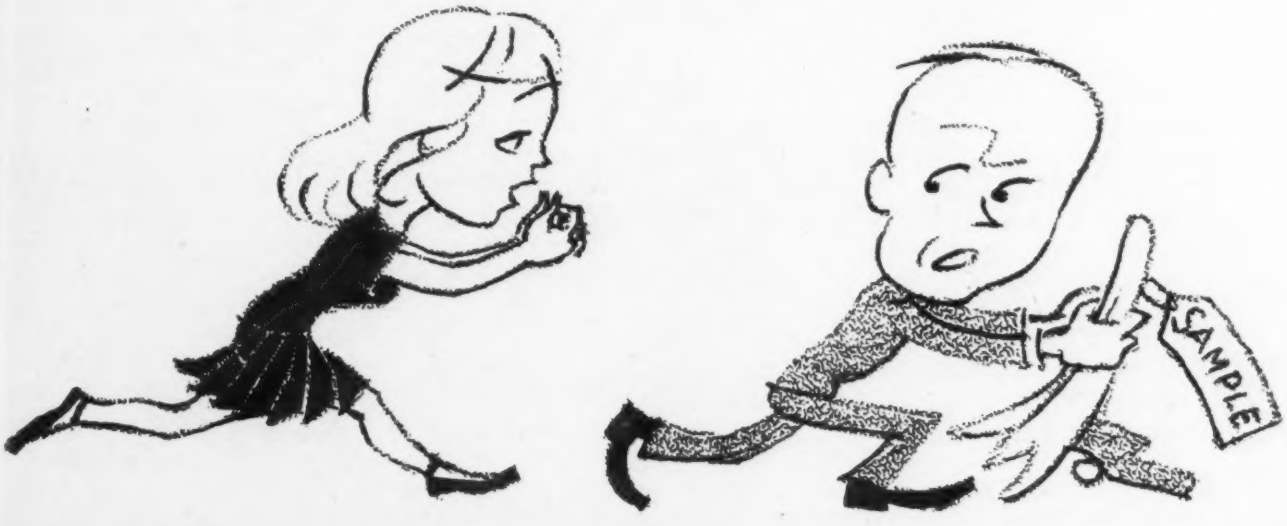
It's Clean Selling

And clear sailing too, for vacuum cleaner production is high and stocks of them are flowing toward your store for you to sell. The waiting list is getting shorter and competition also has stock so it is high time to limber up on ways to persuade people that they need a new cleaner — either those who have none or those whose old cleaner is obsolete.

The best market is that vast number of newly married couples just establishing their homes. Next come the people who have made their old cleaner last through the war years by patching it up, but who really would **like** a modern device with a full kit of cleaning accessories. Many of these do not fully appreciate all the dirty work that a vacuum cleaner can save them because they've never been told or shown.

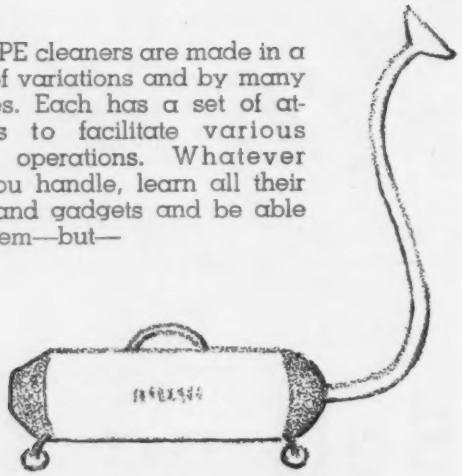
It's no longer a case of hiding your floor sample and beating off the customers with wet sacks. They are not that hot any more. It is you that must get hot with ways to promote and sell the machines that promise to flood your floor before very long.

Inside you'll find some rock bottom methods that have proved themselves since the first cleaner was made. They will still work, if you work them.

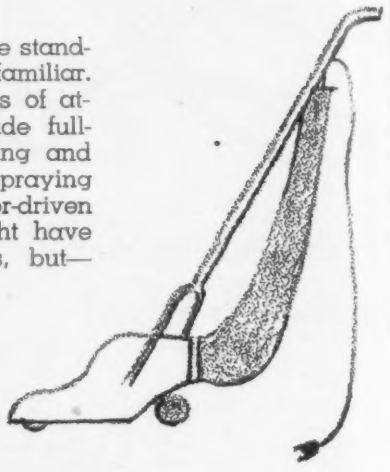


Each Make Has its Features, but—

TANK TYPE cleaners are made in a number of variations and by many companies. Each has a set of attachments to facilitate various cleaning operations. Whatever makes you handle, learn all their features and gadgets and be able to talk them—but—



UPRIGHT TYPES are standard and the most familiar. They, too, have kits of attachments to provide full-range home cleaning and do odd jobs like spraying or demothing. Motor-driven brush and headlight have certain advantages, but—



the Basic Sales Story is the Same

and this is it. Use it in translating the mechanical features into **user benefits.** For although the mechanism may fascinate a mechanically minded man, it means little to the woman whom you want to have buy the cleaner. To some women the machinery is even frightening. The less conscious you make them of it the better they like it.

These are the things a woman buys when she purchases a good vacuum cleaner—yours of course—so tell her:

1. About three-quarters of your time doing housework is spent chasing dirt, madam. If you can have a helper to take over the worst of that job for you, it will relieve you of an unpleasant task, give you a cleaner house, a more sanitary one, one you'll enjoy more.

2. Your rugs will have a longer life and look better their entire life because the vacuum cleaner will remove the sand and grit that cuts the nap and grinds them down. Regular cleaning will keep the nap from crushing flat, keep it resilient and springy, keep its color bright.

3. Vacuum cleaning draws out the moth eggs and larvae and keeps them from attacking your rugs. It is the best moth insurance there is for rugs.

4. Vacuum cleaning takes the germs along with the dirt. Most germs stick to dust particles. By vacuum cleaning you remove and capture the dust, keep it from spreading around the room. Old-fashioned sweeping and dusting just stirs it all up and redistributes it some other place in the room. The vacuum sweeper picks up the dirt once and for all.

5. If you do all your dusting with the attachments of a cleaner you do a much more satisfying job. You get deeper into the corners, the upholstery, the folds of drapery and curtains. You can draw the dust or powder out of drawers, blow it out of radiators and grilles, springs on the bed, etc. You can dust the moldings, draw in the cobwebs and even the spiders.

6. Other attachments permit the spraying of wax on floors, paint on furniture, insect spray in closets, trunks, etc. You can blow moth-repelling gas or crystals into closets, trunks, storage rooms. With the bag removed, a cleaner can be used as a ventilator, to move the air quickly in or out of a room, such as a sick room; to remove odors. The blower attachment can also be used to fluff pillows by blowing air through them.

7. Even the car can be cleaned with the vacuum cleaner attachments. It is good for getting road dust out of upholstery, floor mats, corners, the ceiling. The blower can be used to get rid of dust under the hood, in the luggage compartment, etc.

It still pays to Demonstrate—

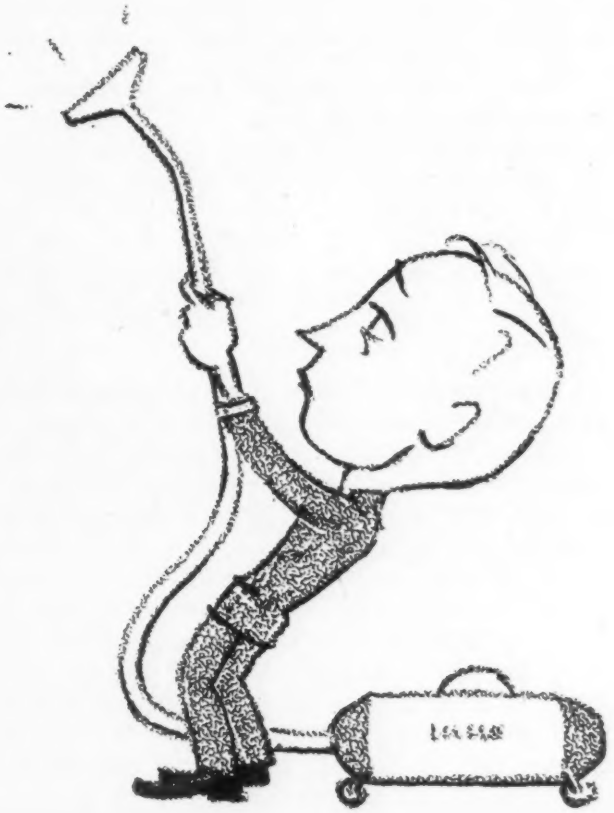
While the profit margin on electrical vacuum cleaners and the price level does not encourage or support the extensive field selling and thorough demonstration in the home that was responsible for the pioneering of the appliance and its high saturation, it is still the best selling method there is. So in preparing to sell vacuum cleaners the smart dealer or salesman will try to determine how to do as much demonstrating as the business will afford, remembering that with demonstration the business will be better. Just how to demonstrate will not be gone into here, for the manufacturers of vacuum cleaners usually have a special demonstration plan or sequence designed to bring out the special features of their own make. It is recommended that this be studied and practiced even if you decide to use only part of it. There may be a question from a prospective customer that can be specifically answered by demonstrating just the answer, not giving her the works. It pays to know the entire routine and be selective in presenting parts of it.

In the Home–

If the old door-to-door selling may not seem justified in the older residential districts, a little checking might disclose many new residential districts, housing projects, veterans' home tracts, where it could pay a bright salesman to call and where necessary, to put on a demonstration. In some cases it might be arranged to hold a demonstration in one home and invite a group of neighbors so as to make one complete demonstration to a mass selling job. Or the house-to-house presentation could be combined with a group of appliances so that if you found no interest in the new cleaner, perhaps the time could be made profitable by selling some other appliance.

In the Store–

If your store gets a lot of traffic it pays to have a table or a space set aside for demonstrating cleaners. If the traffic justifies it one can be going continuously and it can be made to pay. At any rate there should be a place to which a prospect can be taken and shown how the cleaner works.



Don't Underestimate Your Customers

Because customers have been persistent and have asked numerous and sometimes pretty silly questions, it is easy to fall into the frame of mind that customers are a pretty low breed. But are they, now?

In a recent number of a little bulletin issued by the Los Angeles County Chamber of Commerce, called the "Retail Forum," a digest of salient points in an article by Martin Wallard in the "Southwestern Retailer" was printed. It is well worth repeating and with thanks, for it reminds us that we mustn't underestimate the customer:

"Never underestimate the intelligence of your customer," he says. "Never sell her something on the theory that she won't bother to check on your presentation. The average customer today is very discerning.

"Never underestimate the customer's hunger for true facts about the product she buys from you. If there is some question she asks you which you cannot answer, be frank to tell her you don't know the answer now. Don't try to gloss over such a question. Her quick mind will be alert to spot this lapse in your knowledge and it will make her suspicious.

"Don't underestimate the customer's ability to remember. Many rushed merchants have allowed their usual friendliness and courtesy to lapse. That time you lost your temper and spoke gruffly to a customer, you're sorry about it now, but don't think the customer has forgotten. Is there something that you sold a customer, knowing that she wouldn't get as much value out of it as you predicted? Don't figure that the customer doesn't know all about it. She may not have known at the time of the purchase, but she does now and she won't forget what you have done.

"Don't underestimate the customer's ability to buy. It is not always the customers who talk loudest or put on the boldest fronts who are the best customer and who pay their bills promptly. The people who are careful of what they buy and who buy what they need are oftenest the best customers a merchant can have. Never think that the customer cannot afford to buy extra products until he has demonstrated that he cannot pay. Keep selling him until you see that his ability to pay for needed items has reached the limit.

"Don't underestimate the customer's ability to respond. A human being is a bundle of emotions. He or she is subject to moods and many desires. He likes company, even if he is sour-minded at times. That is why 99% of all customers will respond to smiles, to cheerfulness. It also makes them receptive to salesmanship. You will often find tough prospects melting under the slightest human touch.

"Don't underestimate the customer's buying traits. It pays a merchant to adopt merchandising methods that cover many points of approach, because all people do not react alike. You never know what is going to cause a customer to decide to buy from you.

"Don't underestimate the value of a customer. Don't think, when a disgruntled customer leaves you, 'Well, there are many more customers I can get.' Realize that it costs money to win new customers. Always remember, too, that the $50-a-year customer can often be built into a $300-or-more customer by the right kind of salesmanship.

"Never underestimate the customer is a safe rule to go by all the time."

It's a Woman's Intuition, Plus—

So, to sell women home appliances, dealers should know subtle appeals and home service women will help with the groundwork

Marguerite Fenner
Home Service Director,
Pacific Gas and Electric Co.

BECAUSE 85% of the retail purchases are made by women—"how to sell the girls" is still the number one sales problem. Also, because the homemaker has a terrific influence on how many kilowatt-hours go through the meter to be paid for each month, it's the woman again who must be sold the benefits of increased usage of electricity in the home.

First, I'd like to try to explain to you what I mean by "subtle selling"; and second, I'd like to try to convince you that women, thinking with their feminine minds, might actually have an inside track in the matter of reaching and influencing other women's minds.

"Subtle selling" isn't anything mysterious—but it *is* something that is not always practiced by men when trying to sell women. In other words, too many men still try to sell women washing machines, ranges, refrigerators and electric blankets as if they were pieces of merchandise. To a woman, these are *not* pieces of merchandise—they are more free time on wash day, cleaner clothes, beautiful cakes, time-releasing oven meals, and out-of-this-world frozen desserts.

Why does a woman go window shopping and end up buying a new hat when she has ten hats at home? It isn't that she needs a new hat because "she just doesn't have a thing to wear." It's because she sees that hat and mentally "tries it on for size," then she's tempted into actually trying it on, and the sales women *tells her what it does for her*—"Why my dear, you look ten years younger in that hat"—and you men foot the bill. And after footing all of those bills, a mere woman often wonders, why don't you try some of that same sales psychology yourselves?

Women think differently, speak differently and *buy* differently than men think, speak and *buy*. In fact, women are different from men—but as a Frenchman once said, "thank God for that little difference."

Also to be included in "that little difference" is the intangible quality known as "woman's intuition." B. J. Kidd, the well-known advertising woman and author of a new book entitled *Just Like A Woman*, defines intuition as "the single feminine quality that drives men nuts fastest and most efficiently; it's that thing that accounts for the annoying habit women have of interrupting you as soon as you open your mouth, *of answering questions before you have finished asking them.*" It also accounts for the fact that the thing which I call "subtle selling" is a priceless, useful tool when selling women, because, once a woman catches on to the fact that you are trying to sell her, up goes her sales resistance.

The reason a woman buys a new hat which she does not need is because a new hat does more for her—*and does it quicker*—than any other one piece of merchandise. Whether a woman is reading your advertisements, window shopping or "just looking" in your stores, there is always one question uppermost in her mind, "What have you got for me? What will it do for me? Can I just slip it on—for size?"

What do you have for the ladies? What will your products do for them? How can you help them "try it on" to see what it will do? Well, that is the story we not only need to tell, but also need to *show*.

A fair or exhibition is a good example of what I am talking about. Rent 1,000 square feet of floor space and load it with the latest appliances, and in normal times the women will walk on by—all they see is a conglomeration of ranges and refrigerators.

Rent, instead, 200 square feet of floor space, install a model kitchen with one range, one refrigerator and one sink—all in their natural setting, supplemented by an exhibit of tempting pies, cakes, homemade breads and rolls, and manned by an attractive girl baking and serving cookies—and what do you have? *Now* you're talking a woman's language! By *suggestion*, the woman sees the range, refrigerator or dishwasher in *her* own kitchen—and if her kitchen doesn't meet the standards she sees there, she starts mentally doing over her own kitchen.

Did you ever stand around and listen to the conversations that go on at one of those booths, between the women and the home economist? On display are four layers of cake with a little card that reads, "These four layers baked at one time without opening the oven door."

That get's 'em! "How can she bake four layers of cake at one time, when I have a heck of a time baking two? Doesn't she have to open the oven door to turn those cakes to make them brown evenly? All the layers are exactly alike—she *must* have switched them around in the oven! What's her secret—what's the recipe? Well, I guess I'd better have a word with her!"

One question is all the home economist needs and she's off to tell her story. Meanwhile a little gong sounds and that's the signal for another pan of cookies to come out of the oven, just like that—no peeking, no watching! The refrigerator door is opened to get more cookie dough and the women see the interior loaded with real, honest-to-goodness food (not dummy foods—dummy foods leave a woman absolutely cold because she doesn't have that kind of food at home). The pans are nonchalantly washed in the electric dishwasher. Do you think the women aren't taking it all in? I'll say they are, because they *know* that pots and pans can't be washed in one of those new-fangled machines!

Quoting B. J. Kidd again, she says to sell a women, "Put it in her hand—get her to taste it or touch it—have her try it on—let her push it around the floor to see how light it is! Do anything that will get her to make an identification of what you have for sale with herself and her world, and your sale is made." Don't however, forget to arrange for the down payment.

Well, so much for "subtle selling." What I'm really here for is to try to convince you that women, thinking with their feminine minds, might actually have an inside track in the matter of reaching and influencing other women's minds.

There is a big public relations job to be done if we are to continue to build customer satisfaction, and a big educational job to be done if we are to increase the use of existing appliances. These jobs can best be done with a well-balanced home economics

program. A home economics program, as I see it, is a long-range *promotional* plan, but a very short-range plan when it comes to increasing kwh.-per-customer usage.

As chairman of the association's home economics committee, I would like to present our first contribution. It is a utility company Home Economics Plan; however, many parts of it are open to the manufacturer and distributor home economist as well.

Here's How It's Done

The objectives of this plan are no different from the original aims of home service, which were to build and maintain revenue, promote the sale of new appliances and further customer relations. However, an up-to-date home economics plan should no longer be restricted to cooking alone; instead it should cover washing, ironing, house cleaning, home lighting, kitchen and laundry planning, dishwashing, and the hundred other uses for hot water in the home, just to name a few.

I'll start by giving you the objectives of the plan:

1. To promote, directly and through dealers, the sale of appliances and home lighting equipment.
2. To increase the use of electricity through stimulation of a greater use of existing appliances and equipment.
3. To cooperate with public schools.
4. To further customer relations.
5. To further dealer relations.

With those five objectives in mind, it is quite simple to break the program down into three activities:

1. *Promotional*—Under this heading fall cooking schools, demonstrations at fairs and exhibitions; kitchen group demonstrations; assistance to dealers in planning store promotions, and conducting floor demonstrations for dealers occasionally, especially for small dealers or those who are not sold on the value of demonstration.

2. *Educational*—Under this heading comes the item of "increasing the use of electricity through stimulation of a greater use of existing appliances"; also, the correct use and care of appliances already sold; all subjects involving cooking, baking, meal planning, refrigeration, canning and freezing; and a group of miscellaneous subjects which might be classified as long-range promotional activities, such as kitchen planning, laundry planning, home lighting and customer information.

3. *Sales training*—No sales training program should be considered complete until the salesmen—whether they are manufacturer, distributor, utility or dealer—are exposed to the woman's point of view. The home economist really excels at her part in sales training, and even if she did no more than present a complete range demonstration exactly as she would before a group of homemakers, the men would learn the story she tells and *how* she tells it. It is a woman's language—selling *what* the range will do, not the range as a piece of merchandise.

The next step in the plan is "the method of work," and this is broken down according to the groups with whom the work is done.

I'll give these to you, not in order of importance, because their importance will vary according to your own community needs.

Marguerite Fenner

First, there is work which can and should be done with organized groups. An "organized group" is any group which *we do not organize ourselves*, a ready-made audience to whom we can take our story. These include P.T.A. groups, women's clubs, church organizations, business women's clubs, luncheon clubs, etc.

The thing we need here, because we are invited as the guest speakers, are non-commercial programs—educational programs—*subtle selling*. Any presentation on the subject of marketing, food storage or cooking is always welcome. And how can a woman talk about marketing or food storage and not talk about the refrigerator, or about cooking and not talk about the range. Very often, equipment can be brought in so that an actual demonstration can be made, but it still needs to be kept non-commercial.

Programs on the preparation of food for freezing are in great demand, not because many homes have freezers, but because women want to know about freezing, want to see if they *want* to own one and the clever girl with a color film or kodachrome slides shows and tells them how easy it is to prepare vegetables, fruits and meat for freezing: shows and tells them about freezing cakes, pies, bread, rolls and cooked foods; and tops it off by serving frozen cake out of the freezer just long enough to be thawed but still icy cold. Well—no sales are made that day, but the seed for the sale is planted. That's subtle selling.

Visual air presentations (that is, color film or slides) on kitchen planning, laundry planning and home lighting are also very effective and in demand wherever they are offered. What better means is there of reaching a mass of people with our complete story than this simple means through organized groups?

There are many other subjects, but I won't take time to talk about them here, except one which is so timely. All over the country there is a swing toward home entertaining. This is a very natural thing and, if we are smart, we will seize this opportunity to tell homemakers *how* to give a party, what to serve (complete with recipes) and how to prepare them *at home*.

You know it only takes one woman with the urge to give a party to start a complete cycle of parties, because she invites eight or twelve for bridge, then each of the guests feels that she must give a party in return. And when women get together, what do they talk about? Their children, their homes, their husbands—and food.

Mrs. Jones serves one of those luscious cakes and every woman has to have the recipe and goes home and bakes one more cake than she otherwise would bake. Or it is a luncheon and Mrs. Brown serves light rolls hot from the oven—and she tells her guests how easy it is to bake delicious rolls, she learned by attending a cooking class conducted by the utility home economist. When it comes to increasing the use of electricity through stimulation of a greater use of appliances, do you gentlemen realize what just one extra cake or pan of rolls per customer per week would mean? Well, you figure it out because I'm not a mathematician!

Next is the work we can do with special groups. A "special group' is one which we organize ourselves, by inviting the public to our auditorium or outside cooking schools. This type of meeting is promotional; however, it's still a good idea not to be too commercial.

For Dealers Too

And what can the home economist do for dealers? It should not be expected that the home economist be donated to dealers as a free sales person; however, she can render very valuable

assistance. For instance, for larger stores she could suggest programs and procedure for promotions on appliances, and supervise them and secure demonstrators and outside speakers for the program. She could do some demonstration work for a larger dealer to illustrate the value of it.

She could train demonstrators to work in dealers' stores. She could participate in dealer cooking schools, and from time to time conduct group demonstrations on the correct use of appliances to new users. She might also, in some territories, conduct kitchen group demonstrations for dealer salesmen.

Next is our work with schools, and here we feel that there are several jobs to be done. First is the work we can do with home economics teachers and principals, furthering good public relations; second the work we can do with the boys and girls, our future customers; and third the work we can do toward replacing obsolete equipment in use in cooking laboratories in schools.

Any of the home economics presentations built for adult groups can be adapted to high school or college level homemaking classes. Most teachers welcome outside programs because they give added interest to the course of study. Also, because we are more or less experts in our field, our programs are specialized and something teachers are not prepared to present themselves. Equipment demonstrations are enthusiastically received, by both teacher and students. However, a demonstration should never be given using obsolete equipment. Kitchen and laundry planning and home lighting are subjects which are "naturals" for classes in home management or home furnishings.

It is also our job to see to it that teachers know how to use the appliances in service in their departments. This can be done by calling on schools each fall, to renew acquaintance and meet new teachers. On this call, information about equipment can be given to the teacher, a record of appliances in use can be made for reference, and a list of programs available to schools can be left for future reference. If this is done consistently, calls for talks and demonstrations will be received throughout the year, establishing a closer relationship between the utility and the school and giving us another opportunity to be of service and tell our story.

Extra-curricular programs of general interest to schools are needed if we are to reach *all* of our future customers. One which the home economist can present is the story of better light—better sight. This might be done by using the new Walt Disney film, *Light is What You Make It*, with a demonstration prologue by the home economist. This would make a program about thirty minutes in length, just right for assembly use. Programs such as this should first be approved by your State Department of Education; however, its members are very willing to preview programs and will give their stamp of approval if it is merited.

The problem of replacing obsolete equipment in schools is one in which the home economist is vitally interested. However, it is one problem about which the utility home economist can do very little, except to point out the advantages of using modern equipment and to tell teachers and principals about the special equipment plans being offered by manufacturing companies. On the other hand, the manufacturer's and distributor's home economist, backed by her own company range plan, can do a real selling job in schools, and we hope that this problem will be taken over by them.

Next is our work with individual customers, a service in the home and rightly called "home service." However, it is the only part of a home economics program which can be termed "home service," and the fact that this plan is called a home economics plan and that our committee is called a home economics committee is not by accident.

The home call can do more to further good customer relations and to insure satisfied customers than any other utility service. In competitive territory it is a "must." and in any territory this service will pay its way through stimulation of greater use of existing appliances.

Thousands of dollars are spent every year to promote the sale of new electric ranges. An electric range is just so much dead timber to the utility until it is on our lines and, unless it is replacing competitive fuel, will do little toward building load unless the homemaker uses it *more* than she used her old range. Also I might say here that the advent of precooked, frozen, dehydrated and other processed foods, as well as the extensive use of the pressure sauce pan, are going to vitally affect our cooking load because the homemaker will be required to spend less time at the kitchen range than ever before. The answer to this one is selling the homemaker on oven meals, broiler meals, cooker meals and more home baking, because quick cooking involves only the use of the surface units.

A great deal could be said about the work the sales department could do with its own company employees, not only with such company salesmen who sell, and the servicemen who handle complaints, but with *general employees* who to the customer, are company representatives. I think that all company employees should be shown and told what's new in modern appliances and equipment. I think they should know something about their correct use and care and benefits to the homemaker; otherwise the industry as a whole does not tell a coordinated story.

Late Data—but it has Value

Received too late to include in the February Statistical & Review number were several replies from utility companies containing revised figures for last year's number of customers, kilowatt-hour consumption, sales and saturation. Likewise, they contained a number of comments which are pertinent, which contain food for thought and therefore will be briefed here.

El Paso Electric

From H. A. Walsh, new business manager, El Paso Electric Co., came these comments,

"Materials shortages and inexperienced labor have been a considerable problem in connection with furnishing added service to new customers and the extension of our lines to serve new loads. In spite of these difficulties, we have picked up loads faster and have installed more lines and distribution facilities than before the war. There have been, and will be, a few special customers to whom we will not be able to furnish service by the time it is needed, due to lack of critical equipment such as transformers.

"We feel that we are about in the same position as other industries and our customers with regard to the difficulty of obtaining material. For all practical purposes we have been successful in meeting the demands made on us but this has been done only through overloading existing facilities, substitution of materials and furnishing of service on a flat billing without meters. In numerous instances we have been forced to spray transformers with water in order to carry loads demanded of us."

Northwestern

From J. C. Plankinton, assis ant

general manager, commercial department, Northwestern Electric Co., Portland, comes some surprising figures for the total number of ranges, refrigerators and especially water heaters sold in Portland, both in the territory of his company and that of Portland General Electric Co. In 1941 there were 7,493 ranges, in 1946, 6,080, in 1941, 15,218 refrigerators, in 1946, 7,045, in 1941, 2,995 water heaters, in 1946, 8,324. The division of sales on Northwestern lines and those of Portland General are on the ratio of 40% Northwestern, and 60% Portland General, he says.

Because of the shortage of materials, transformers, meters, poles, etc., he says "Also it has necessitated our adopting rather stringent policies concerning addition of loads for space heating." As evidence, copies of letters dispatched to manufacturers, jobbers, distributors of electrical heating equipment were sent. These letters indicate that applications for house heating service will be accepted on a contingent basis only, and connection to the lines made as soon as the company is able.

City of Alameda

In contrast to this the Bureau of Electricity, Department of Public Utilities in Alameda, is in better position, according to G. A. Baxter, secretary. Shortage of transformers, etc., has not caused any delay in serving the demand required by its consumers, he says, but while the supply of these items is rather low, "we anticipated the shortage far enough in advance to avoid the condition in which many utilities find themselves."

Correcting the previous figures, the number of residential consumers, as of Dec. 31, 1946, was 12,421, average annual kwh. consumption per resident consumer for 1946 amounted to 1,500 kwh.

City of Los Angeles

Charles C. Snyder, business agent of the power system, Department of Water and Power, Los Angeles, corrects the previous figures as follows: Number of residential customers, as of Dec. 31, 1946, 475,638, none in the rural classification; commercial, 95,680; industrial, 7,284. The average annual kilowatt-hour consumption for residential customers was 1,386.

The number of electric ranges installed in Los Angeles in 1946 was 2,322 and water heaters 1,091. If appliances are available, the market for 1947 should be: ranges, 7,500; water heaters, 4,800.

"Commercial cooking load is promoted by a program embodying: wiring reimbursements at $4 per kw., direct mail to cafes, restaurants, and other prospects, and prospect development by department representatives. Kitchen layouts are made, wiring specifications provided, demonstrations are held for prospects, there is coordination of displays at shows, and repair and maintenance services.

"Commercial lighting load is promoted by: prospect development; illumination recommendations by the engineering staff; educational programs with architects, engineers and contractors, and educational talks to service clubs and sales groups. As the load presently being added appears to utilize all equipment the manufacturers are able to deliver, and the illumination engineering staff are busy with prospects from other sources, no advertising is planned in the near future, although direct mail and display advertising are under consideration for the near future.

"Shortage of men and materials has not delayed the installation of new services that require only a meter and a service drop. Delays up to three or four weeks have occurred on installations requiring extension of distribution facilities and/or transformers. Shortage of skilled labor is the cause of most delays at present."

Puget Sound P & L

From Seattle, at the other corner of the West, Puget Sound Power & Light Co., according to Pat Johnson, vice-president, corrects its previous figures as follows: "The number of commercial customers is approximately 28,400 for Dec. 31, 1946, and 25,300 for Dec. 31, 1945, an increase of 12%.

"A recent check on storage type water heater accounts showed that we have about 55,000 storage type tanks on our system or a saturation of approximately 25% instead of the 20% previously estimated. This does not include side arm and other heaters that do not conform to the special water heating rates.

"Our program for commercial cooking is not what you would call promotional. Shortage of equipment has slowed this activity, but a good demand is still felt for commercial cooking. Lack of facilities to serve this load is the real problem. Shortage of transformers and line material have tended to discourage its promotion.

"Our commercial lighting program is one of assisting the customer to get the proper lighting by advising him as to what type equipment he needs and giving him all the assistance possible. Again here the demand far exceeds the supply and we find more requests than we are able to handle. Generally we would say that our extensive efforts in the past in the promotion of good lighting are bringing results today.

"Our agricultural program is going along about the same as in the past. The demand for farm equipment continues to increase. Our laboratory and farm consultants have their hands full in trying to answer requests and assist the customer with his utilization problems."

Gray's Harbor PUD

Kelly Westrom, manager, Public Utility District No. 1, Grays Harbor County, serving Aberdeen and Hoquiam, has this to say:

"We find our transformers overloaded, principally for the reason that appliances like portable heaters have been manufactured in large quantities and sold to consumers without our knowledge. Although we do have a record of large appliance installations and know the connected load, we are unable to determine the unconnected load portions. Consequently, we are not in a position to clear requests for service until such time as transformers are made available. Although we did construct approximately 25 miles of rural extensions during 1946, and plan to build approximately 40 miles of rural lines this year, it has been and still is difficult.

"The figures compared with 1939, the last year before the district acquired the electrical properties, show that average annual kilowatt-hour consumption for residential customers increased from 652 to 2,162, commercial lighting from 3,559 to 5,968; commercial power from 5,578 to 26,792 and industrial power from 1,238,933 to 2,082,808.

"The average annual billing per customer for residential in 1939 was $30.17 and in 1946, $35.78. Customers increased from 9,568 in 1939 to 11,394 in 1946, but the average revenue per kilowatt-hour decreased from .046 to .017.

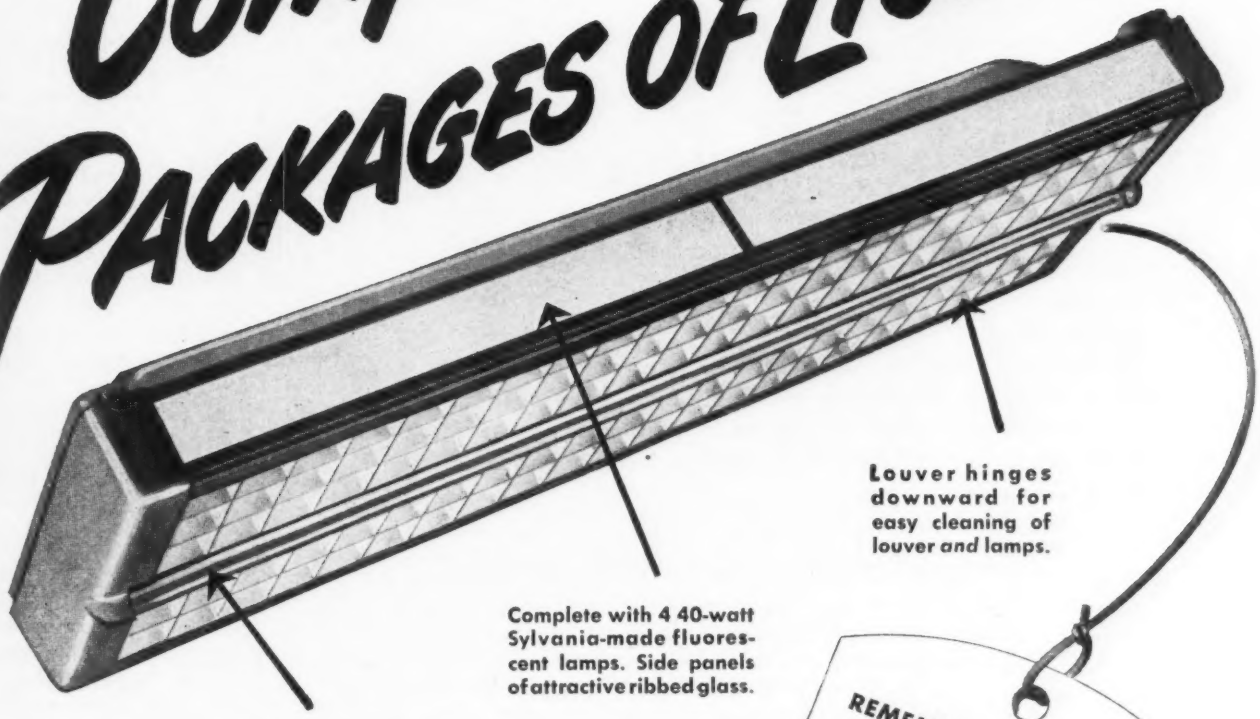
"Saturation of water heaters in 1939 was 0.06, in 1945 was 15.07, and in 1946 was 21.25; of ranges it was 10.36 in 1939, 21.71 in 1945, and 26.63 in 1946."

California-Pacific

California-Pacific Utilities Co., which operates a number of utilities in widely scattered parts of the West, also reports a surprising sale of electrical appliance volume by the dealers in its territories. The company itself does not merchandise. It served Baker, La Grande, John Day, Burns, Oregon; Lassen, Weaverville, Needles, Calif.; Winnemucca, Nevada and Malad City, Idaho, a total of 14,911 domestic cu-

SPECIFY THE QUALITY FLUORESCENT FIXTURES THAT ARE

Complete PACKAGES OF LIGHT!



Louver hinges downward for easy cleaning of louver *and* lamps.

Complete with 4 40-watt Sylvania-made fluorescent lamps. Side panels of attractive ribbed glass.

Not necessary to remove a single nut or screw to change starters or lamps.

REMEMBER ALL LAMPS IN SYLVANIA FIXTURES ARE SYLVANIA-MADE... THEREFORE OF THE HIGHEST QUALITY
They have all the rugged qualities, brilliance and the many refinements that will far surpass the standards of the most critical buyers.

CL-440—one of Sylvania's line of modern, attractive commercial fluorescent fixtures—tops in streamlined-styling—with *every part*—housings, lamps, ballasts—guaranteed by *one* manufacturer.

Sylvania's complete packages of light embody the best in engineering and quality... beautiful lines... an ease of maintenance that's especially important to every one of your clients! And there's an ideal fixture for every lighting need.

Specify guaranteed *complete* packages of light. Less trouble for you... the best in lighting for your clients! Sylvania Electric Products Inc., Salem, Mass.

"Fluorescent at its Finest!"

FOR OFFICE, STORE, HOME, FACTORY

SYLVANIA ELECTRIC

Carry the Ball and Build Revenue with WESIX Wired Heat SYSTEMS

5 plays will carry the ball from the line of scrimmage into the end zone and score in terms of profitable load . . . because the WESIX Wired Heat system not only satisfies the increasing public demand for 100% electric homes but provides increased revenue at the same time.

Thermostatically controlled automatic heaters prevent waste of current due to overheating . . . provide uniform or steady loads with maximum consumer comfort.

The fully insulated house requires less connected load . . . leading to a saving in transformer and service capacity . . . producing a flat load characteristic.

Correctly sized heaters provide sufficient capacity without excess to keep demands at a minimum.

Code requirements. By their utilization 100% electrically heated homes can be controlled . . . and planned distribution systems can meet the exact locational demand of the load.

Good diversity. Since each room to be heated requires a separate heating unit, thereby eliminating unnecessary over-all heating, demands are not co-incident . . . and with thermostatic control good diversity is assured.

THESE 5 PLAYS SCORE THEY BUILD REVENUE

WESIX ELECTRIC HEATER CO.
390 First Street, San Francisco, California

CARRY THE BALL WITH WESIX
AND SCORE WITH A PROFITABLE LOAD

tomers in 1946. Its annual average kilowatt-hour per customer increased from 1,306 in 1945 to 1,748 in 1946. Its annual revenue per customer rose from $50.32 per customer to $54.39, and its average rate dropped from 3.85c to 3.11c.

There are 98 dealers in the various towns mentioned and in total they sold 757 refrigerators, 475 ranges, 995 water heaters or a total of 2,227 units which is at the rate 15.2 per hundred customers.

Says E. A. Nickelsen, commercial manager, "This establishes an unprecedented record of sales of major appliances to our domestic customers. More than 15% of our total domestic customers purchased one or other of the three major electrical appliances. Records available in two of our larger districts indicated that 1946 sales exceeded any year since 1935, except the year 1941 when total sales in these districts were approximately 8% greater. This we feel is quite some record in the face of the reputed shortage of such major appliances."

"Saturations for these companies run as follows: refrigerators, 80%; ranges, 39%; water heaters, 18%; washers, 80%; vacuum cleaners, 70%; ironers, 5%; radios, 96%.

"Sales potentials of appliances are excellent because of the pent-up demand for equipment, the purchasing power of the people generally, and a great need for additional housing in all areas. We note, however, the trend for purchasers to become more discriminatory on price and quality and better sales technique on the part of the dealer salesmen will be needed to get their share of the business. There is also an increasing number of customers who are asking for time payment terms."

It was suggested in this report that electrical manufacturers can collaborate to remedy the shortage of transformers and service equipment by allocating more of the critical materials, such as steel, copper, etc., to the initial production of this equipment rather than appliances."

● California Electric Supply Co., recently issued a lighting fixtures sketch book, as a sales promotion piece on commercial and industrial lighting fixtures. It was the result of the lighting fixtures survey made by means of a postcard to northern California commercial and industrial establishments, and purchasing departments. The sketch book was really an idea book, not a catalog, and was something different in wholesaler literature. Layouts of interiors, showing different lighting arrangements with various types of fixtures were sketched.

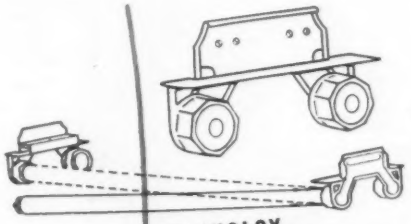
new Series "40"
BENJAMIN FLUORESCENT UNITS

bring these 3 exclusive Benjamin Developments

● You'll find new beauty... new utility... high efficiencies in the new Series "40". Important and exclusive Benjamin developments, such as are illustrated here impart a new streamlined smartness... a new ease of installation... greater freedom from glare... quicker maintenance. One outstanding advancement is the new exclusive BENJAMIN SPRINGLOX Safety Lamp Holder... a practically indestructible, one-piece socket that actually makes it easy to insert and remove the lamps! No more forcing ...no more difficulty positioning prongs. Only when you actually use SPRINGLOX can you appreciate the great forward stride represented by this exclusive Benjamin development.

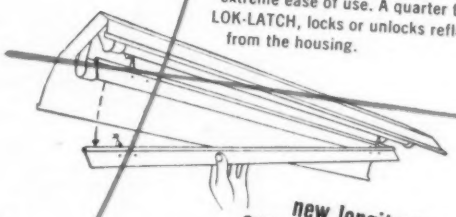
Along with all these new features you get that same famous Benjamin built-like-a-battleship construction... Benjamin Life-Time porcelain enameled heavy gauge steel lighting reflectors... conformance with all applicable RLM standards and other industry specifications ...for all these things are essential to *finest* lighting at *lowest* per-year-cost. With Series "40" as with all other Benjamin units, you can be sure you "Light Right when you Light with Benjamin."

Series "40" units are NOW IN PRODUCTION. For delivery dates consult your Electrical Wholesaler; for CATALOG BULLETIN on new Series "40" write Sales Promotion, Dept. J. Benjamin Electric Mfg. Co., Des Plaines, Illinois.

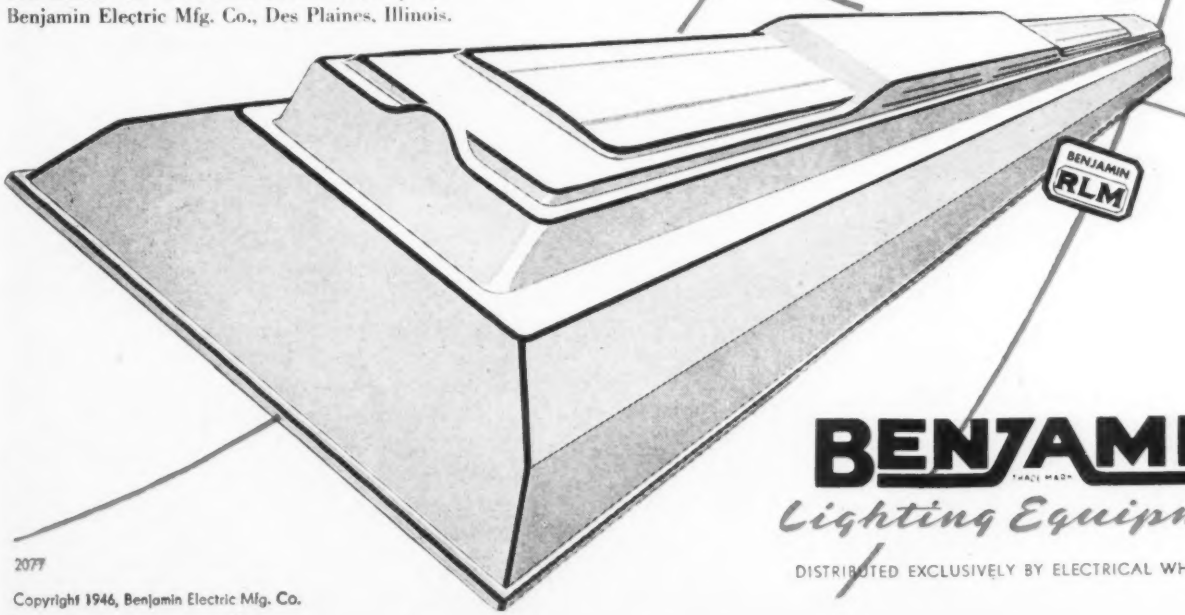


new SPRINGLOX safety lamp holder—Simply push one end of lamp into the holder and let the resulting spring pressure push other end into facing socket. Spring pressure locks lamp into position; it can't drop out!

new LOK-LATCH is a new adjustable reflector fastener that combines positive fastening of reflector to channel with extreme ease of use. A quarter turn of LOK-LATCH, locks or unlocks reflector from the housing.



new longitudinal SHIELD increases overall shielding from 13° to 27°. An optional attachment which may be attached to all Series "40" and previous models of Benjamin 2 lamp fluorescent units. Meets RLM standard specifications.



BENJAMIN
Lighting Equipment

DISTRIBUTED EXCLUSIVELY BY ELECTRICAL WHOLESALERS

2077

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new ATTIC FAN TIMER by Paragon

HERE'S a new member of the Paragon family . . . the AF Series for timing attic and window fans.

Entirely new in design, this timer is offered in two time ranges, 0-10 hours and 0-20 hours, each fully adjustable to any position on the dial . . . a real convenience for the user.

Equipped with a quiet Telechron motor and an improved switch, the timer is rated for high capacity, and will handle a ½ HP motor. Beautifully finished drawn aluminum case, anodized, with dial and pointer protected by clear Plastacele.

Underwriter approved, all electric, no springs, mounts easily to Handy box or single gang switch box, or may be surface mounted with conduit connections into the bottom of the timer. The setting may be changed at will without harming the instrument. Timer motor runs only when timer is actually in operation.

Get your orders to your jobber—now and start planning installations early. Complete data sheet on request.

AT ONLY $9.75 AN OUTSTANDING VALUE

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1616 Twelfth Street
TWO RIVERS, WISCONSIN

Paragon Two Rivers WISCONSIN
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1905

APPLIANCE PREVIEW

Fold Away Ironer (329)

An ironer which, when not in use, can be folded away in a white enamel cabinet has been introduced to the Apex line. The ironer cabinet is 36 in. high, 18 in. wide and 25 in. deep; offers work space when it is closed and during ironing operations. Roll and shoe move outward from vertical to horizonal plane, while the cabinet remains stationary

The roll is the standard 26-in. size, 6½ in. in diameter; is governed by knee and

finger-tip controls; has two ironing speeds and a stationary position for pressing. Dual thermostats are provided for exact temperature control and to permit the operator to use half the ironing surface, if desired. Temperature selection is in 50-deg. steps between 300 to 500 degrees.

The ironer operates on the patented Apex "floating roll" principle, with the roll moving toward and pressing against the stationary shoe when either knee or fingertip control is pressed. One switch controls the current supply for heating shoe and operating roll. An illuminated nameplate indicates whether current is off or on. A safety switch releases roll pressure instantaneously, it is stated.

Washer (330)

A patented principle, "Centric Agitation," is a feature of the 1947 ABC-O-Matic washer manufactured by Altorfer Bros. Co. The principle is a variation, in shape and movement, of the standard agitator. Vertical rolling washing action was replaced by a horizontal action, resulting in a surging motion, inward and outward from the center in all directions, at the rate of 156 times per minute. The pulsating movement causes each of the 12 agitator vanes and the central column of the agitator to form centers of action within the water, alternately creating pressure on the outward surge and suction on the inward surge, the manufacturer states. The washer is said to handle a 12- to 14-lb. load and to complete a wash of as much as 72 lb. in 30 to 40 min.

Electric Furnace (331)

Electromode Corp. is manufacturing an electric furnace for house heating. It has six patented elements such as those manufactured during the war for submarine heaters; is equipped with a Minneapolis-Honeywell Muduflow system to control the heating coils. The furnace is being made in two sizes, one for homes with eight to 12 rooms, containing up to 24,000 cu. ft. of space; the other for up to 11,000 cu. ft. Each is 48 in. high; width varies from 26½ to 33 in. and height from 58 to 72 in. Cabinets are of white enameled steel and have chromium trim bands.

Bathroom Heater (332)

Thermador has in production an improved model radiant electric heater, 48 in. long, 9 in. wide. Switch is located at the top of the grille and recessed to prevent its being flipped accidentally. The aluminum reflector is etched for maximum radiation of infrared rays. The new grille contains less metal to absorb heat and infrared rays and permits more cold air intake at the base for greater air circulation. Available in three models: 1,650 watts, 115 volts; 1,650 watts, 230 volts; 2,000 watts, 230 volts.

Portable Heater (333)

A 1,250-watt portable electric heater weighing less than 5½ lb. has been announced by Westinghouse. It is made of aluminum, satin finish; is 15¼x10⅜x9⅛ in.; equipped with carrying handle. This heater combines radiation and convection principles; operates on 110-120 volts. Approved by Underwriters' Laboratories.

Adjustable Fixtures (334)

Faries Mfg. Co. has in production a fixture for use with the RS type sunlamp or a therapeutic heat lamp. The upright stem of the stand is adjustable in height from 39 to 60 in. measured from bottom of shade to floor; has a patented slide fitting for adjustment without use of screws, or thumb nuts. Arm extension is 18 in. to end of shade. This unit is equipped with porcelain socket, feed through switch and 9½-ft. cord.

An adjustable fluorescent desk lamp has been added to the Faries line. Called the Glider, this lamp is adjustable vertically and horizontally; is finished in electroplated statuary bronze and polished chromium, the announcement states.

Heater Bricks (335)

General Ceramics and Steatite Corp. is offering a new line of heater bricks for use in electric stoves, grills and hot plates. These bricks are available in four colors, with exposed surfaces highly glazed.

All-Brite •• HINGE-MASTER*

- *Glass is Hinged to Drop Both Ways*
- *Fixture Body is Hinged for Accessibility*

* *Manufactured under exclusive License Patent No. 2284534*

In this new, amazing All-Brite Fixture . . . the dream of every electrician and maintenance man has come true. Changing tubes, starters, sockets, ballasts . . . or cleaning of fixtures is a pleasure. Installation and maintenance time are cut in less than half.

Available for 4 20-watt and 4 40-watt tubes with louvered or glass bottom . . . with *insta-start* or conventional ballast.

All these new features at no increase in price.

SOLD THROUGH RECOGNIZED JOBBERS ONLY
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TESTED AND APPROVED

Manufacturers of
"ALL-BRITE" Fixtures

BRONCO
WIRE
is tough!

Bronco has what it takes to meet your toughest requirements. You can be sure of maximum performance —with Bronco.

WESTERN
INSULATED WIRE CO.
1001 E. Sixty-Second St.
Los Angeles 1, California

FOR WIRE IN THE WEST—
IT'S WESTERN

Store Lighting (336)

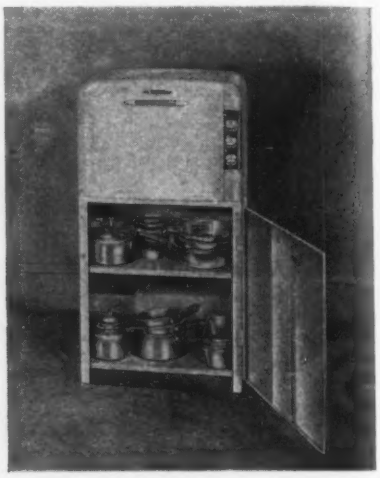
Westinghouse has announced a Merchandiser store lighting system, consisting of 2- or 4-light fluorescent luminaires for general illumination and matching, 2-light adjustable incandescent spot lights for highlighting. The fluorescent and incandescent elements are complete in themselves; the luminaires can be mounted in continuous strips of F units or spot light sections can be added as desired. End caps are available for any arrangement of luminaires. Canopy switches can be provided for the spot light sections so that lights not in use may be turned off. Spotlights are adjustable through a 35° angle vertically and can be rotated through 345° horizontally.

Range Line (337)

Universal has announced eight new range models, led by a deluxe model with two "Tru-Bake" ovens. Each oven will have automatic recessed flood lights, the new push-button automatic preheat, cutout and temperature control. Surface units will be super-heat, monotube thrift units with heat control; switch panel is located on the back splasher. The auxiliary oven, the "Thermo-Chef," is an automatic well cooker with time and temperature controls and is said to fulfill all functions of a large oven. Cooker lid has a heat-proof glass window to permit a view of the cooking operation.

Other features are recipe holder with mirror, utility cabinet, utility drawer, platform lights, counter balanced oven door with dual hinge, spring lock, sliding oven shelves with lock stop action, non-warp broiler pan with smokeless grid.

The new Universal Bantam is a complete range with oven large enough for a 22-lb turkey. It plugs into any appliance circuit outlet. The range is 22½ in. wide, 14 in. deep and 42 in. high. Imbedded coils are wrapped around an all-steel heavily insulated porcelain enamel oven lining to provide a maximum input wattage of 1,650 watts thermostatically controlled for baking and roasting. Two units mounted on a steel frame are interchangeable for broiling operation or for surface cooking. Oven door and oven lining are porcelain enamel, all other surfaces are hi-baked white enamel finish with chrome trim.



Thermostat (338)

A miniature thermostat, called the Mighty Mite, manufactured by Mechanical Industries Production Co., was designed for electric blankets and heating pads but, according to the announcement, can be used for other appliances, electric motors, air conditioning systems, etc. The manufacturer claims that it is tamperproof, dustproof and waterproof and can be molded in rubber and various plastics. Contacts are ⅛-in. silver. The standard model is for use up to 300 watts, 100 volts, or 150 watts, 220 volts a-c non-inductive load; is preset for fixed temperatures up to 300°. Models are available for settings up to 600°.

Retractive Cords (339)

Two retractive electric cords, the Extendo utility extension and the Recoilo washing machine replacement cord, have been announced by the Koiled Kord division of Kellogg Switchboard & Supply Co. The Extendo is an 8-ft. cord which retracts to 16 in., and is self adjustable. The Recoilo extends to 8 ft. from a retracted length of approximately 12 in.; has heavy rubber insulation and Neoprene outer jacket covering.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

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336 337 338 339

Name..... Company*..... Title*.....

Address.....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

Top quality is Best at any price

651-F

FLEX-LOC LAMP HOLDER
Listed and Approved by
Underwriters' Lab., Inc., and
Canadian Standards Association
Appliance Division
E.T.L. Test Report 314454 Available
Patented—Other patents pending

Pay more . . pay less . . but you just can't beat them. They're the best!

FLEX-LOC by Lloyd, is THE outstanding achievement in lamp holders . . no other can match its performance! Briefly, the name "Flex-Loc" tells the story. Flexible . . it automatically self-adjusts to variations in length of lamps, or the spacing of mounting holes . . then "click", it locks the lamp securely . . positively! Ingeniously engineered! So simple. So foolproof. So easy to use. Flex-Loc is a MUST in the specifications of many lamp manufacturers.

HERE'S ANOTHER BEST

A marvel of modern science. Lloyd's Automatic Starters play a BIG part in lighting the lamps of industry. There are millions in use throughout the country! Engineered for quick, sure starting of fluorescent lamps and built to specifications far more rigid than accepted standards . . here is the automatic starter that can't be beat! Results? Saves maintenance costs and power consumption. Protects and insures longer life to ballast and lamp. Eliminates the annoyance of flickering and blinking.

FS-40

AUTOMATIC STARTER
Listed and Approved by
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Certified by E.T.L. Spec. 6
Pat. Nos. 2200443-2228210

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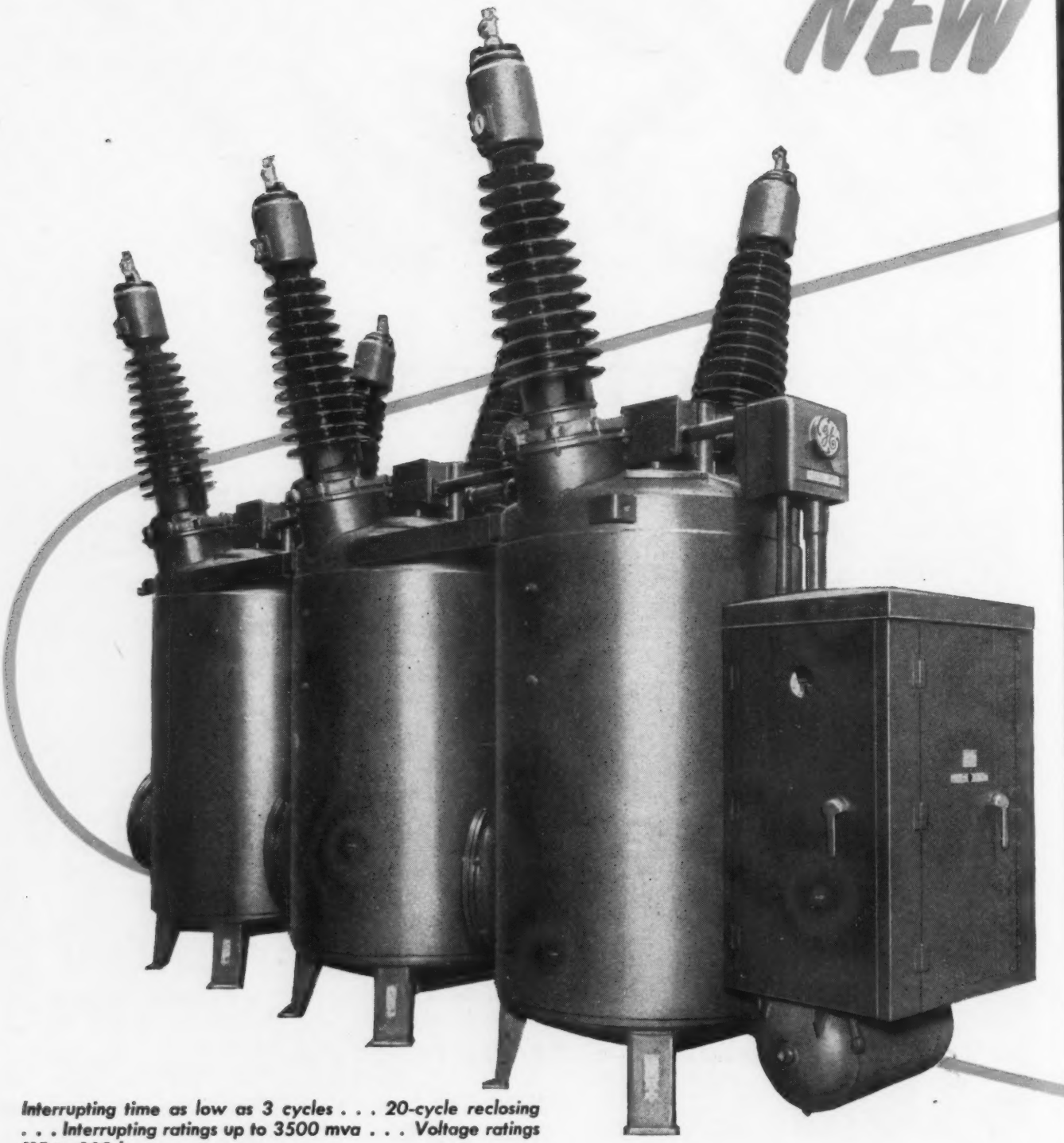
TYPE "439" OIL-BLAST

NEW



Interrupting time as low as 3 cycles . . . 20-cycle reclosing . . . Interrupting ratings up to 3500 mva . . . Voltage ratings 115 to 230 kv

BREAKERS

FROM TOP TO BOTTOM

The FK-439 is the latest development in a long line of G-E heavy-duty outdoor breakers. Besides interrupting time of either 5 or 3 cycles (with 20-cycle reclosing), this new unit also brings you many outstanding design features including—

1 COMPLETELY SEALED BUSHINGS

Maintenance is reduced to an absolute minimum by having the bushings completely sealed from the atmosphere. Compact design with the porcelain parts held in compression assures reliability and strength. A magnetic-type oil-level indicator is easily visible from the ground. Experience with over 80,000 moderate-voltage sealed bushings gave General Electric the proper background for developing these completely sealed bushings for high voltages.

2 SIMPLIFIED INTERRUPTER

Light weight and simplified construction of the multi-break interrupter assures faster circuit interruption for greater system stability. Improved performance characteristics have been thoroughly proved by extensive field tests. Contact maintenance problems are almost negligible because of arc-resisting contact materials.

3 SELF-CONTAINED AIR MECHANISM

High-speed reclosing is accomplished by the smooth, positive action of the pneumatic mechanism. This type of apparatus, with a background of eight years operating experience, is completely self-contained. Pneumatic operation means lower control power requirements resulting in smaller batteries and control leads. Electrical and pneumatic controls are readily accessible through the three hinged doors of the mechanism housing.

4 IMPROVED TANK CONSTRUCTION

Sturdy leg-type tank supports facilitate inspection and painting under the tank, permit a reduction in the size of foundation pads. Large side manhole openings provide convenient accessibility to the interior of the tank. This not only permits ready inspection of the interrupters but also easy removal of bushing current transformers. New design features throughout the breaker have resulted in a reduction in tank dimensions and overall unit weight.

Your G-E sales representative has detailed information on the Type FK-439 breaker. ***Apparatus Department, General Electric Company, Schenectady 5, N. Y.***

GENERAL ELECTRIC

859-5-7400

THIS MONTH'S NEWS

A Picture of the Atom

Prof. Alvarez of University of California has been using this story in his talks to lay audiences to illustrate how physicists arrive at their notion of what an atom is. Suppose you had no idea what men were like, but you knew there were six of them in an inaccessible valley several miles away. You can see the surrounding hills, but you can't see into the valley itself. Well, you start shooting artillery shells into the valley, and every once in a while you see an arm or leg fly into the air. If you watched long enough and counted carefully enough, you might be able to figure out what a man looked like.

Saving Money Underground

In congested downtown areas in Oakland, PG and E has been using manhole secondary buses as a means of handling more power per cubic foot. The buses consist of racked, insulated conductors. PG and E figures that in these particular instances of very heavy load concentrations the bus scheme has advantages over junction boxes in economy and flexibility.

Addenda on Nuclear Power

G-E's engineers at Hanford are now publicly stating that nuclear electric power plants will be feasible very soon and will not be difficult to handle; but they will compete with coal at about $10 per ton; significantly, this is above energy costs anywhere in the U.S., and three times those in the West, but below present costs in most foreign countries, including Britain, France, Italy and Russia.

There She Blows

Fuse links of 50- and 100-amp. cutouts were scrutinized by the department of laboratory tests, Los Angeles power, which found that they interrupted anywhere up to 200% rating; each of six different makes behaved very consistently, however.

Forecast on Gas Turbines

First utilities to use gas turbines will be in the West or Southwest, J. R. Carlson, Westinghouse, Philadelphia, told San Francisco mechanical engineers—where gas and liquid fuels predominate. Quick starting and low cost of stand-by favor gas turbines for utility service.

About Those Heat Pumps

Courtright, PG and E's San Joaquin manager, has been recalling how Emory Wishon once warned his gang to watch out for desert coolers and how there are those who wish they'd watched closer, what with coolers hanging all over the lines throughout the hot country; now Wishon has said to keep an eye on heat pumps, and he's being taken very seriously . . . Indications of the growing interest in heat pumps are articles in popular magazines, financial pages, and even Sunday supplements; *Architectural Forum* recently ran a heat-pump roundup, and several trade journals have special issues in the works . . . The Los Angeles power department has been displaying a Drayer-Hanson unit on a turntable in their downtown show window; it brings to mind a new auto on display.

Sunshine on Little America

You may not have thought of it, but Admiral Byrd did. An abundant supply of G-E sunlamps will enable his task force to sun bathe regularly during the coming three months of total darkness.

The Law Considers PUDs

Trend toward conservatism in the administration of PUD activities in Washington state appears in legislation introduced into the legislature at Olympia, where three bills to curb the unrestricted powers of PUDs are receiving support.

Westward Westinghouse

Industrial expansion seemingly hits new highs monthly here in the Far West. Names of great national organizations as well as hitherto unheard of new local concerns make the headlines. Last month was the electrical industry's turn when Westinghouse announced the 10-year lease (with option to purchase) of the war-expanded Joshua Hendy plant at Sunnyvale, Calif. "Another milestone in recognition of the industrial growth which now characterizes the West Coast," is the way Westinghouse Pacific Coast Vice-president Charles A. Dostal described the deal.

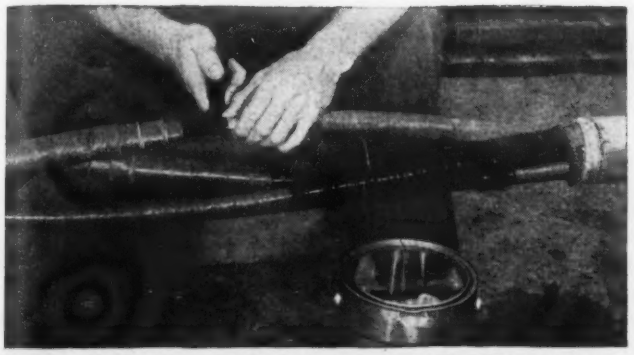
A Lot of Wind?

Still stirring is the somewhat mysterious 1,500,000-kw. Army-Navy West Coast project, reputedly a full-scale supersonic wind tunnel for testing planes and missiles. Rumor has placed it at various locations where a power supply of that magnitude would be available. One recent suggestion is that it be split, with one portion assigned to the present Ames Aeronautical Laboratory. The resulting 500,000 kw. needed to power the motors could be secured during off-peak periods from the Pacific Southwest power pool, according to proponents of this proposal.

Fuel Fight Flares Again

Gas-electric competition, dormant during the war, is breaking again on several fronts. Los Angeles power men found that because the city has municipal power and a municipal airport did not mean a field day in planning the facilities at the new airport. The gas people put up a terrific pitch for the large kitchens in the airport administration building. Politics didn't win for either contender. What won was superior selling of a superior product by the power department's business agent's division. The kitchen is all-electric. The battle is going forward on a national scale too. Current skirmish is to see what kind of kitchens will be put into 90 new veterans administration hospitals.

Naturals for utilities!



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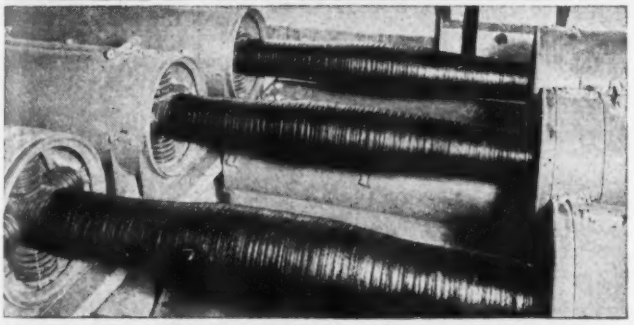

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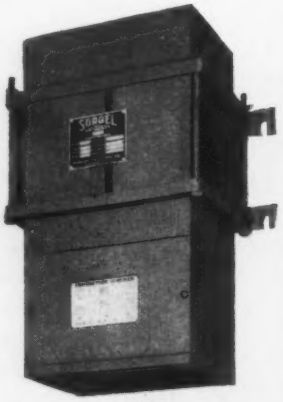
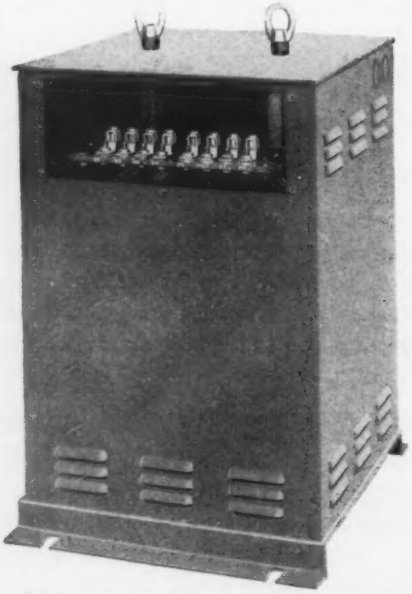
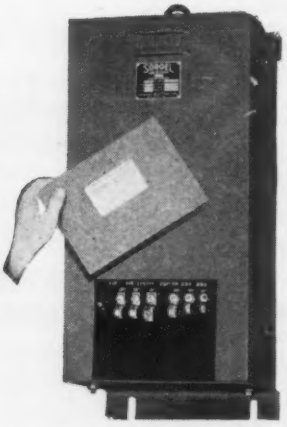


5 KVA,
Wall Mounting Type



50 KVA. Single phase.
Floor Mounting Type.
With cover of connection compartment removed, showing solderless terminals.



15 KVA. 3-phase
Wall Mounting Type
Showing connection
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OREGON BODY OVERRIDES VETO ON POWER BILL

Overriding a gubernatorial veto, the Oregon legislature last month passed a bill removing from the state hydroelectric act of 1931 a provision that the state or a city may take over privately constructed power dams on two years' notice by payment of net investment and severance damages. Passage of the bill will allow companies to retain their sites for the duration of their licenses, normally about ten years.

Passage of the bill paves the way for construction by Idaho Power Co. of a $12,000,000 dam across the Snake River in Oregon.

The measure originally was passed by the house, 46 to 14, and by a unanimous vote in the senate. Governor Snell vetoed the bill on the ground that it would deprive the state and municipalities of their privileges of acquiring licensed hydroelectric projects without resorting to condemnation. The override vote in the house was 43 to 17; in the senate, 27 to 3.

PUDs Try Again to Repeal Vote on Bond Issues

In another attempt to change the Oregon PUD law to permit issuance of revenue bonds without a public vote, public power advocates are asking the state legislature to repeal the provision for issuance of general obligation bonds (which they say is never used by Oregon PUDs) and to give PUD directors the right to issue such bonds at their own discretion.

Proponents claim that the provision for submitting the issue to voters of the district is unnecessary and impractical. They claim that this requirement has been a serious handicap in negotiations for acquisition of private power company holdings and that, because of it, of 12 districts in which the people have voted to organize PUDs, only three have been able to go into business.

● CONTRACTS totaling $217,575 for equipment at the Leaburg power plant have been awarded by the Eugene, Ore., Water Board. Allis-Chalmers Mfg. Co. received the contract for a 225-r.p.m. generator on a bid of $132,845. Contract for a turbine with stainless steel inlay was awarded to the S. Morgan Smith Co. for $85,730. With improvements scheduled for the Waterville power plant, the new equipment will give Eugene a power potential of 43,500 kw. as compared with the present 34,000 kw.

No more Scarecrows *in the sky*

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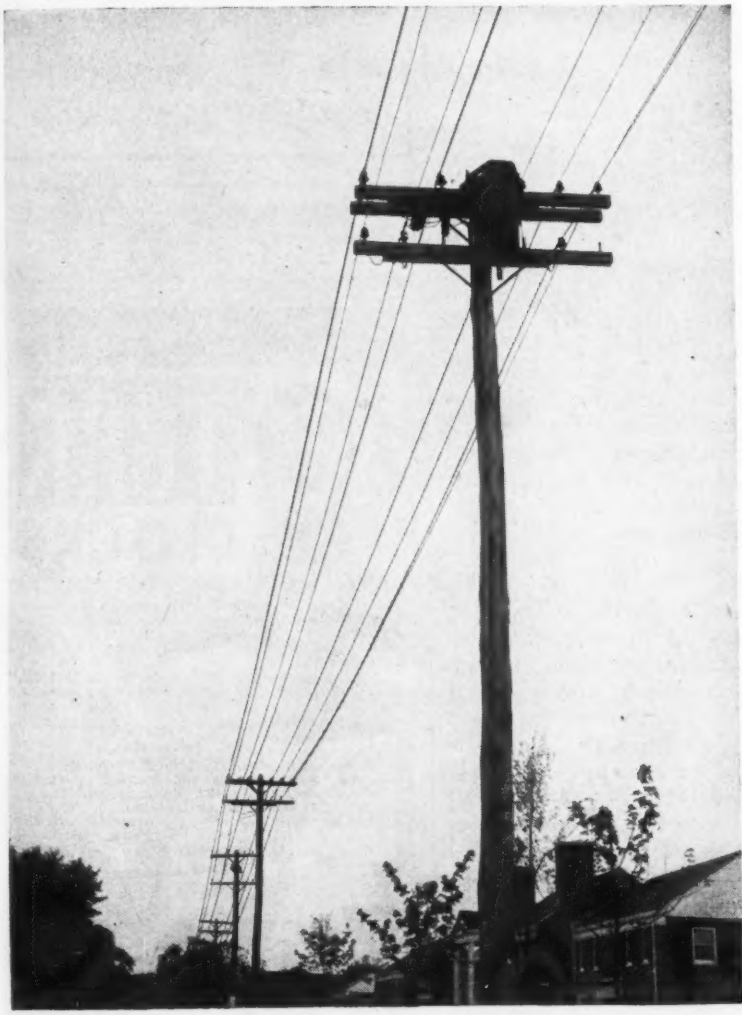

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PUD REACHES AGREEMENT ON PURCHASE PLAN

Rescinding recent action, Grays Harbor PUD commissioners have reached an agreement with the Skagit County PUD over the proposed purchase of Puget Sound Power & Light Co. properties in Grays Harbor County, Wash. The condition of such acquisition, according to Commission President Henry E. Bailey, would be similar to those in the property purchase contracts which the Skagit PUD, as agent, has signed with other PUDs in western Washington.

Explaining the commission's recent action in withdrawing its agreement to allow the Skagit PUD to act as agent, Commisioner Oliver Morris declared: "The previous commitment was taken a long time ago, without a definite agreement as to the details of the property to be ultimately acquired and power supply—these matters have now been discussed with Skagit representatives, and the principal points necessary for incorpation in the final contract of purchase have been agreed upon."

Court To Evaluate Pacific Properties

Evaluation of Pacific Power & Light Co. properties in Franklin County will be made in Superior Court at Pasco, Wash., starting May 12. Condemnation proceedings were filed by Franklin County PUD in June 1945.

A similar suit in Benton County last year brought a valuation award of $1,265,000, about three times the PUD estimate. While Benton County paid the price and took over the property, a PUD may refuse to accept the condemnation award, and pay litigation costs.

● California Electric Power Co. has applied to the state's public utilities commission for permission to continue to export electric power to Baja California, Mexico, through the Mexican company, Electrica Mexicana. The company has been supplying Baja California with such power for about 25 years, transmitting to a station at Mexicali for distribution to industrial districts.

● Water Supply should be well above normal this summer in the Columbia, Colorado, Rio Grande and Great Salt Lake basins, if rainfall is normal through June, it was announced by the Department of Commerce.

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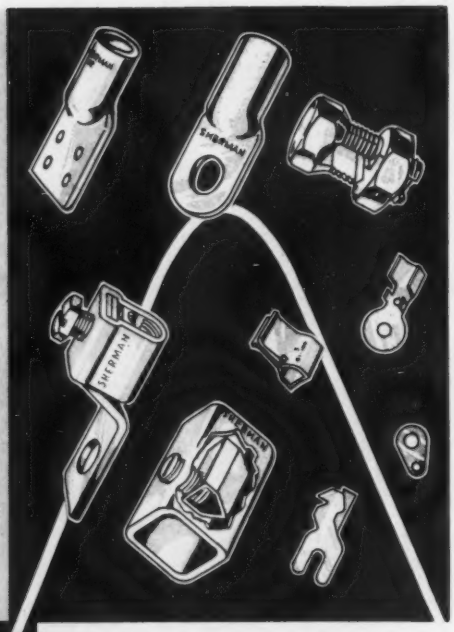

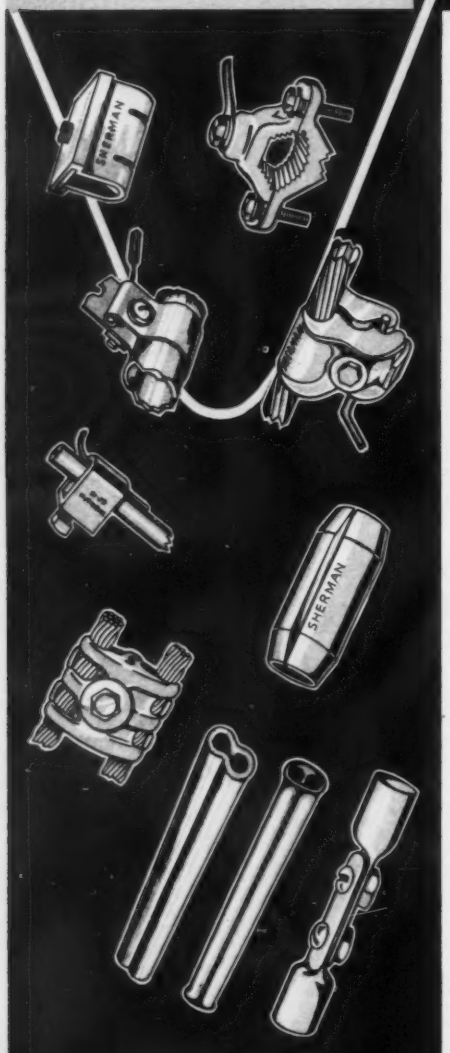

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COURT RESTRAINS CO-OP LINE BUILDING PROGRAM

A "cease and desist" order was delivered to Mesa Electric Cooperative by the California Public Utilities Commission, following California Electric Power Co.'s request that the commission take jurisdiction and prohibit the co-op to build duplicating lines. (EWEST, February, p. 128). The case is the first test in California of state control of REA-sponsored cooperatives.

The order instructed the cooperative to stop operation and construction until it gets a certificate of public convenience and necessity. The co-op contended that it did not need such a certificate from the state because it was not a public utility.

Mesa has secured two REA loans totaling $495,000 on a $2,000,000 limit agreement for line and plant construction to serve 348 in the Victorville area. In its appeal to the commission, the company states that its main lines go through the area and that plans have been completed for company development.

Boise Gas Company To Abandon Service

Following a hearing on Jan. 27, the Idaho Public Utilities Commission has announced issuance of its final order authorizing the Boise Gas Light and Coke Co. to abandon its public utility service and operations in Boise. The order concluded proceedings begun in April 1944, when the gas company asked authorization to discontinue service on the grounds of continuing operating losses and deterioration of service facilities. An arrangement was worked out whereby the gas company's approximately 1,700 customers could be changed over to electric service or to other types of fuel without expense to the customer. At the final hearing, the Idaho Power Company reported it is supplying 1,649 former gas customers with electric service, including 1,480 with residential electric cooking, 596 with electric hot water heating, 108 with electric refrigeration, in addition to numerous miscellaneous electrical appliances and commercial installations.

● PACIFIC POWER & Light Co. is building a three-story addition on the north wing of the Public Service Bldg. in Portland. The construction will add 7,500 sq. ft. of floor space for employees of Pacific company and of Portland Gas & Coke Co.

INDUSTRY-WIDE BARGAINING...

Death Trap for Business, Suicide for Free Labor

IF CONGRESS is to succeed in its present efforts to prevent strikes in key industries from devastating the nation, it will have to put a crimp in industry-wide collective bargaining. This kind of bargaining is designed to apply agreements between employers and organized workers on wages and working conditions to an entire industry.

Further, if extension of this type of bargaining is not curbed, there is reason to believe that it will undermine the freedom of both American business enterprise and American wage earners. For, while increasing the destructive power of labor disputes, the general spread of industry-wide bargaining would so concentrate the fixing of wages—by far the largest element in the cost of production—that government regulation would be a next short step. With that step taken, freedom for business enterprise and freedom for labor would be well on the way out.

Unfortunately, industry-wide bargaining is commonly regarded as presenting a general conflict between organized labor and employers, with unions favoring it and employers opposed to it. This mistaken notion raises the heat of much of the discussion without increasing the light. The fact is there is no such general conflict. Employers and organized workers are on both sides of the argument about industry-wide collective bargaining. For example, while some union leaders are characterizing as labor baiters all those who raise the slightest question as to the desirability of industry-wide bargaining, organized workers in the air transport industry are strenuously opposing that type of bargaining; and the employers are advocating it.

Some Employers Like It

The reason there is in fact no clear cut issue between employers and unions over industry-wide bargaining is readily understandable. It presents certain advantages to both sides in the bargaining process. For example, union advocates of such bargaining generally stress the fact that industry-wide agreement on wages protects wage standards from being undercut by lower wage areas and lower wage employers. By much the same token, however, employers who like it often emphasize the fact that industry-wide bargaining may save certain well-managed and prosperous companies from being singled out for particularly heavy wage exactions. This general point has been underlined in both the full-fashioned hosiery industry and the West Coast paper and pulp industry. There, local unions, affiliated with international unions, have protested that industry-wide collective bargaining prevents them from getting from especially prosperous employers wages as high as they could get if allowed to go it alone in collective bargaining.

So long as employers remain subject to the federal antitrust laws while unions are exempted, the balance of power in industry-wide bargaining would seem to be heavily weighted on the side of the unions. If, for example, employers were to announce an intention to match an industry-wide wage increase by an industry-wide price increase, there is no doubt that they would promptly be indicted for violation of the federal antitrust laws. Even so, the fact remains that some employers favor industry-wide bargaining while some segments of organized labor are against it.

A Clear Cut Public Issue

The industry-wide bargaining issue as it affects the public, however, is clear cut. It is concentration of economic power (in the hands of both unions and management) which can make industrial conflict devastating to the public welfare. At least five times within about a year—in steel, on the railroads, in the maritime industry and twice in the soft coal industry—strikes prompted by union efforts to impose industry-wide agreement about wages and working conditions have paralyzed large parts of the nation's economic life.

In soft coal about 90% of the production workers are members of the United Mine Workers. In steel

about 80% of the production workers are members of the United Steelworkers, C. I. O. In some other key industries there is a comparable degree of concentration of union control. In the face of such concentration many employers see no alternative but to get together on their side for industry-wide bargaining. But when they do so in key industries, the odds are lengthened that failure to agree on wages and related matters, will result in generally ruinous conflict. If agreement is reached, the chances are increased that it will take too little account of the welfare of the consuming public.

It is possible to have industry-wide bargaining on many subjects other than wages. *But the main interest is wages; and the main drive is toward industry-wide and ultimately nation-wide uniformity. Such uniformity is the deadly enemy of industrial decentralization and the pioneering expansion of industry in new areas.* Why pioneer, with inexperienced workers, if the wage rate must be uniform for the whole industry? Moreover, it would also be hard to conceive of a more effective way to put a blight on local efforts to improve industrial relations than to make wage rates and other working conditions uniform throughout the industry and then the nation. *However, among many other dangers, the overshadowing danger in industry-wide bargaining lies in its concentration of economic power.*

Wages Monopolized

On the average, the cost of labor accounts for about two-thirds of the total cost of all industrial products. The universal spread of industry-wide bargaining would thus concentrate in relatively few hands control of the greater part of the cost of industrial production. There is no reason to believe that even without disastrous strikes, such concentration would long continue free from government regulation. That would turn more earth for the graves of American business enterprise and American working men's freedom.

Those who believe that industry-wide bargaining serves the public well—and many sincere people do—stress the fact that, on the whole, it has worked in the industries where it has been tried over a considerable period. Most of the industries of which this is true, however, are not key industries. The pottery industry, the glassware industry, and the silk and rayon dyeing industry—to cite a few in which industry-wide bargaining has been practiced with considerable success—are important industries. But they are not industries in which strikes would have a ruinous impact on the nation. In contrast, a strike in the soft coal industry as the result of a breakdown of industry-wide negotiations quickly becomes a national disaster. The dangers inherent in industry-wide bargaining are multiplied accordingly.

England No Guide

Those who think extension of industry-wide bargaining would be good for the public often emphasize the fact that it has worked smoothly in England, where it has been extensively practiced. *Not the least of the things it has smoothed in England, however, is the transfer from private enterprise to state socialism of industries in which industry-wide bargaining by monopolistic unions and employer groups had so badly undercut competition that private enterprise had lost much of its justification.* A general extension of industry-wide bargaining could be expected to have the same consequences in this country.

The best way to curb industry-wide bargaining is a question which lies beyond this discussion. *Much would be accomplished if the federal government would discontinue its active promotion of industry-wide adjustments, in the fields of both labor and management, at which it has been busy ever since N. R. A. days. Still more would be accomplished if the federal antitrust laws were applied with even-handed justice both to unions and employers—a course urged in the 53rd editorial in this series.* Perhaps a definite limitation of the scope of labor agreements would also be necessary.

The effects of industry-wide bargaining in increasing the extent of public regulation of industry will vary. They will, of course, be less pronounced in railroads and other public utilities, which are already extensively regulated, than they will be elsewhere. For unregulated industries, however, industry-wide bargaining carries the threat of extensive regulation and, along the way, of industrial conflict devastating to the public. In these excited times, to say what I have said here is to invite characterization by overheated partizans as a foe of legitimate union progress. That is perhaps not so bad, however, as to qualify as a pall bearer for both American business enterprise and some of the basic freedoms of American working men. That may well be the fate of those who blindly accept the expansion of industry-wide collective bargaining as being "in tune with the times."

President McGraw-Hill Publishing Company, Inc.

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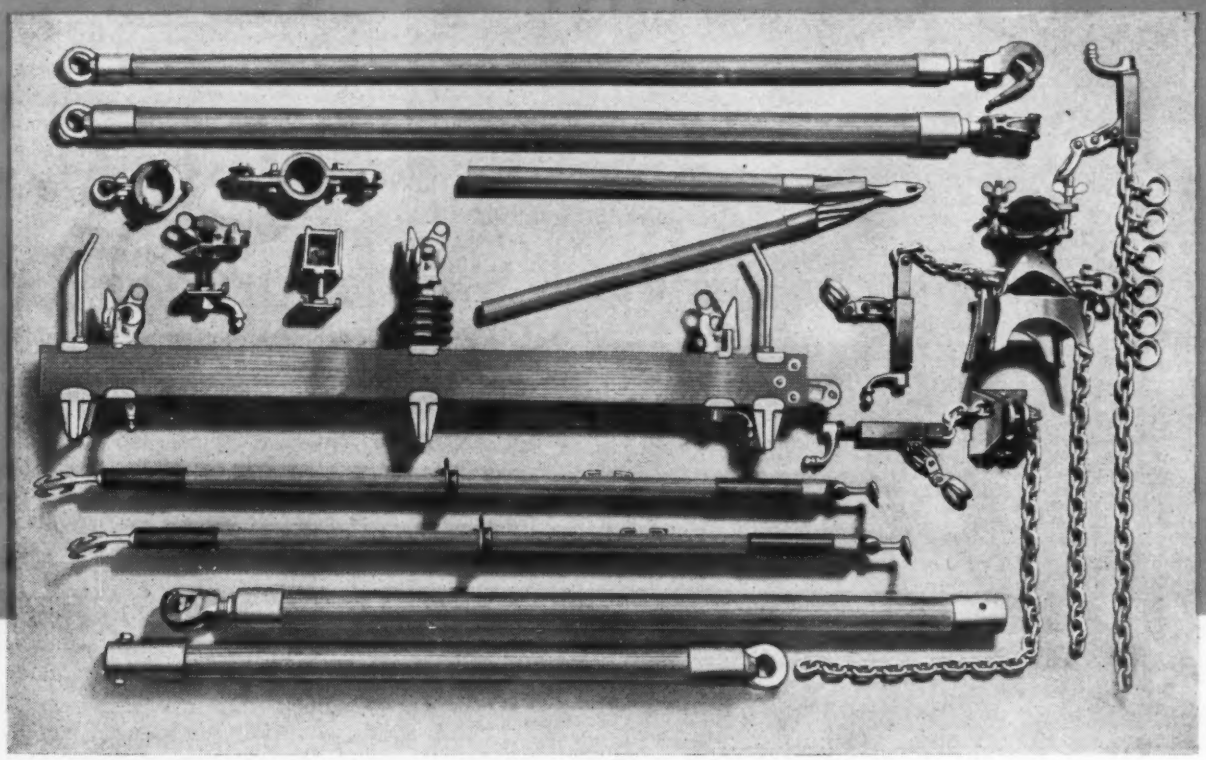

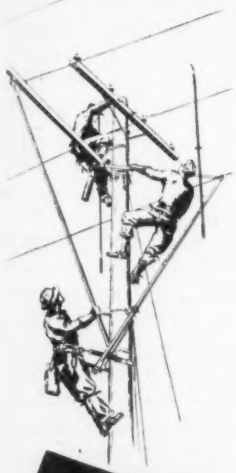

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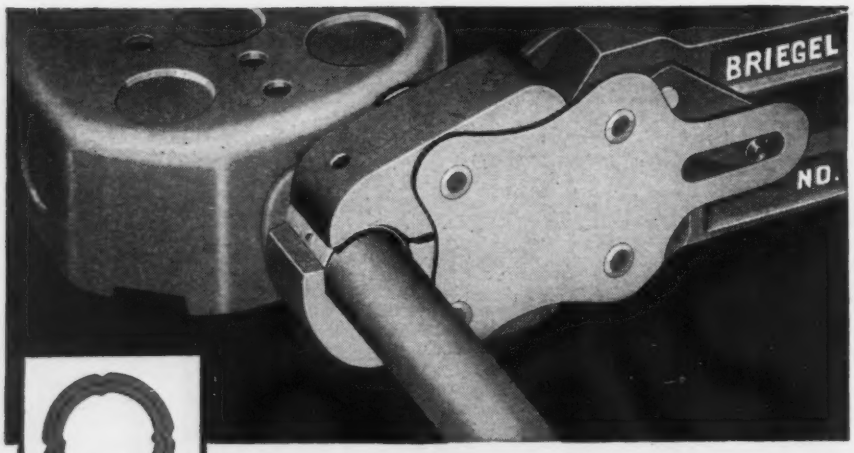

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AGREEMENT NEAR ON SRVWUA TAKE OVER

After nearly two years of negotiations, representatives of Salt River Valley Water Users Assn. in central Arizona and USBR were reported near agreement on proposed purchase of association properties by the federal government. Under present arrangements, the bureau will take over all association facilities except those for the distribution of irrigation water and electric power, and will operate the association's power transmission lines.

Though Interior and SRVWUA spokesmen insisted that the association's financial status was sound and that the negotiations did not represent an effort by the government to "bail out" the Phoenix irrigationists, they admitted that the association was "seriously handicapped" by a heavy bonded indebtedness as a result of investment in its several irrigation and power plants. The association also is the defendant in a several-year-old suit of the government involving nonpayment of federal taxes.

SRVWUA currently operates eight hydroelectric plants with a rated capacity of 70,950 kw.

Noting that power operations of the SRVWUA plants were considerably curtailed during recent months because of the shortage of water in central Arizona, Reclamation officials said they were prepared to bring energy from their Colorado River plants—Parker and Davis Dams—into the region when, and if, the Salt River facilities are purchased. Though transfer of the properties must be authorized by Congress, little or no funds will be sought in new appropriations, they said. Receipts from power operations will supply whatever funds are necessary to close the deal, they added.

Reclamation may not convert the 25-cycle facilities of the Salt River hydro plants to conform with the 60-cycle equipment of its Colorado River projects. One plan being considered by Interior power engineers calls for maintenance of the present facilities of the four major SRVWUA plants to supply energy to nearby copper mines and other distribution systems built for 25-cycle operation. In such event, the smaller hydro projects—at the Cross Cut, South Consolidated, Arizona Falls and Chandler plants—might be retired. The steam and diesel plants are easily adaptable to 60-cycle operations, the engineers reported.

A Navy power train of 10,000-kw. capacity, which was dispatched to Tempe at the height of the recent drought, still is being operated in connection with the SRVWUA plants.

GROUP REPORTS AGAINST MORE DAMS IN COLUMBIA

There can be no economic justification for building more dams in the Columbia River until the full potentials of present dams are developed, the Oregon Legislative Interim Fisheries Committee has reported to the state legislature.

Citing figures to show that the Columbia salmon pack has been reduced 50% over a long-time average since 1942, "when real effects of the obstructions were first felt," the committee said that equipping the dams with fish ladders and lifts would not solve the problem. "The best devices ever installed are at Bonneville dam and yet there has been a big loss both in up-stream and down-stream migrants," the report said.

Declaring that talk of a power shortage unless more dams are built "seems to the fisheries people to be in the nature of propaganda," the committee recalled that only six of Grand Coulee's eventual eighteen generators have been installed and that six more generators are possible at the privately owned Rock Island Dam. With these installations completed, the report said, there would be a power surplus of 1,500,000 kw.

No objections were raised to the Willamette Valley flood control project, as fishing and recreational interests have been successful in their efforts to eliminate high dams in the main stream of the river and by substitution of low dams in its tributaries.

Seattle City Light Sells Bond Issue

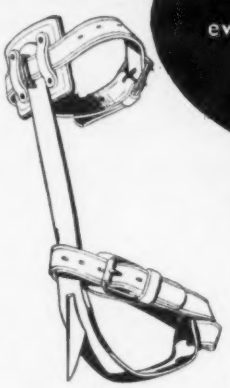
Seattle City Light has sold $8,361,000 of its bonds on the best terms ever offered for its securities.

A $6,500,000 issue of new revenue bonds to finance expansion of the Skagit power project went to Blair & Co. at a 2.07209% effective interest rate while $1,861,000 of refunding bonds were purchased by Blyth & Co. at an effective interest rate of 1.8346%. The best offer of previous years had an effective interest rate of 2.535%.

The larger issue, callable after five years, bears a 2% coupon interest rate while the smaller, callable after ten years, has a 1¾% coupon interest rate.

● USBR will remove a mass of rock debris from the left bank of the spillway channed at the Kortes Dam and power plant in Wyoming. Removal is necessary to prevent partial blocking of the improved channel by slides.

When you're up on that pole, Mister, quality and comfort mean everything! Just ordinary equipment isn't good enough. It must be the best!



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❷ Buckingham No. 56-R Floating *Tool Belt* is made of tan color harness leather and lined with soft chrome lace leather. No metal contacts the body. The "floating" feature insures full-open tool loops under all working conditions. An additional feature is the resilient, rubberized wool body padding, for extra comfort and ease.

❸ Here's another example of Buckingham quality — where quality really counts! Buckingham *Safety Straps* — made by workmen who recognize the responsibility that each belt carries with it.

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UTILITY REPLIES TO BOKE STATEMENT

Statement of Richard L. Boke, USBR regional director, that central and northern California face a power shortage, was declared "erroneous in its assumptions and misleading in its conclusions" by A. Emory Wishon, Pacific Gas and Electric vice-president and general manager.

In a statement to newsmen, Boke had declared it evident that the area faces a "critical shortage of power facilities which makes necessary the earliest possible completion of the Central Valley project power features, including both generating and transmission facilities." He had listed three events which he claimed pointed toward a developing power shortage: (1) turndown of the Reynolds Metal Co.'s application for power to reopen the Riverbank aluminum plant near Modesto; (2) San Francisco "blackout," when a large section of the city was temporarily cut off from electric service; (3) threatened drought which already has forced a curtailment of power production at Shasta Dam in order to save water.

Wishon's rebuttal was in the form of a letter directed to State Engineer Charles H. Purcell, who is also chairman of the Water Project Authority of California. Wishon stated that the company had not refused to serve any customer; in fact had made an offer to the Reynolds Co. last October to supply the Riverbank plant, but had received no reply. The offer still stands, he added.

At the time Wishon made his statement (early February) the company's water storage was 90% above normal, which he credited to heavy carry over from last season and to use of steam to supplant water power as far as possible. "Even if precipitation should be deficient from now to the end of the season, all our storage reservoirs are expected to fill. If rainfall is normal from this time, we will have a reasonably good water year," he stated.

The service interruption referred to by Boke was purely local in origin and scope and had no relation whatever to adequacy of power supply, according to Wishon.

Pointing to the company's $300,000,000 construction program under way, he said that between 1946 and 1951, PG and E will add 700,000 kw. in hydro and steam. An additional 200,000 kw. of dependable capacity will be added to the Shasta project, he said, making the total new capacity in the area more than 50% of the dry year capacity available at the end of 1946.

"We wish to repeat," Wishon concluded, "that the company is prepared to market all power produced at the Shasta and Keswick dams as rapidly as it becomes available. We are now completing an additional double-circuit steel tower line south from Shasta substation at a cost of about $6,000,000. We will be ready to take all the power produced or to be produced at Shasta and Keswick dams whenever it may become available and will be prepared to distribute that power throughout northern and central California. . . . "

Copco Granted License For Power Plant

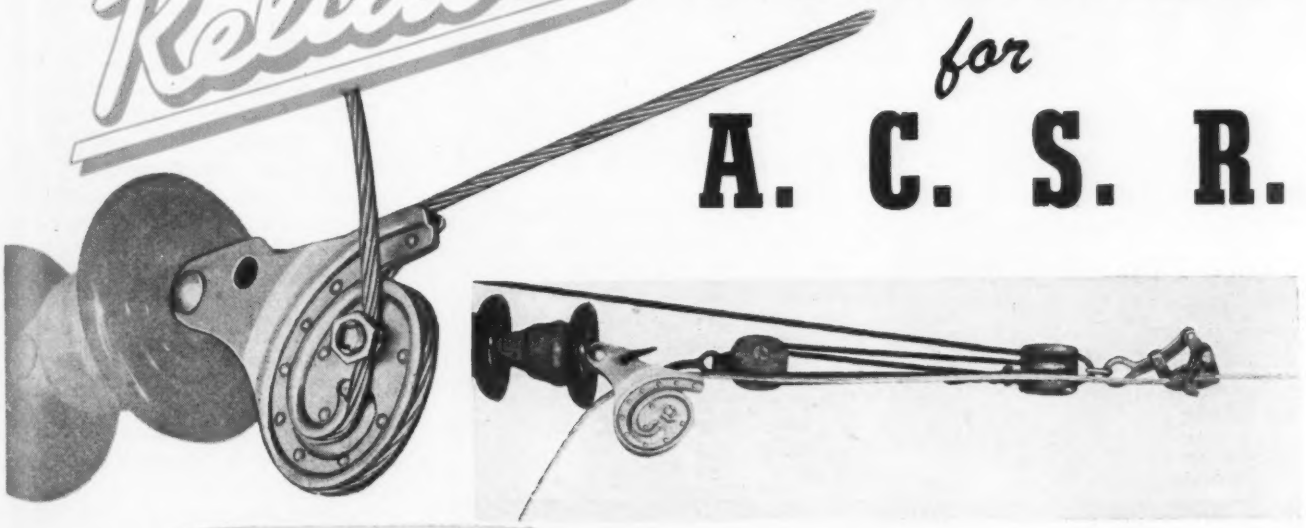
A license for construction of a $3,500,000 power plant on the North Umpqua River in Douglas County, Ore., has been granted by the Oregon hydroelectric commission to California Oregon Power Co.

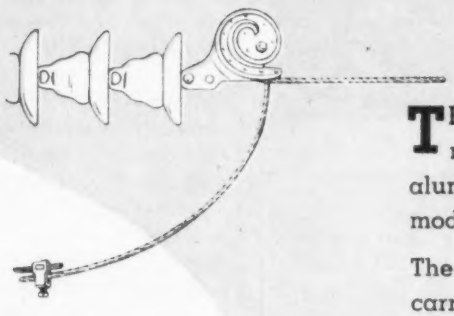
Plans for the project call for utilization of a maximum of 850 cu. ft. of water per second to operate a power plant with an installed capacity of 25,000 kw. A 40-mi. transmission line will connect the project with the main system of the California Oregon Co. at Dixonville, near Roseburg.

The diversion dam will have a crest length of 350 ft. It will be of earth construction, with a concrete lined spillway. Water will be carried from the dam to the power plant through 880 ft. of 9½-ft. wood stave pipe, 5,600 ft. of concrete lined tunnel and 1,500 ft. of steel pipe. The power house, of steel and brick construction, will cover two vertical reaction turbines which will operate under an effective head of 405 ft. These turbines will connect with two 12,500-kw. a-c generators.

Peacetime radar got a commercial demonstration in the San Francisco Bay area, when a G-E electronic navigator was installed on the Southern Pacific ferryboat "Sacramento" for a test run of the security device. At right above, Captain Hans H. Valentine, in charge of the ferryboat, looks into the viewing screen of the scope. The hood is required for daytime operation, when light dilutes the radar images. At left is the rotating antenna mounted above the wheel house. This antenna sends out beams to locate obstacles in the ship's path

Reliable SNUB DEADEND for A. C. S. R.



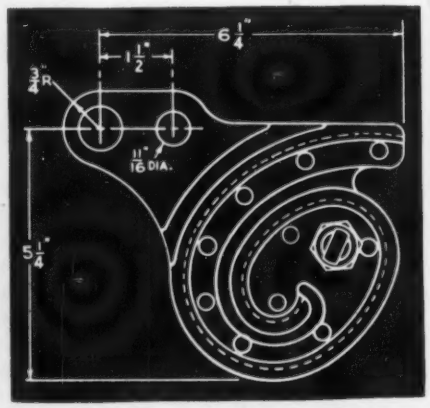


THE RELIABLE No. 420 Snub Deadend is made of high strength, non-corrosive aluminum alloy, is low in cost and accommodates No. 2 or No. 4 A.C.S.R.

The spiral form of this deadend for A.C.S.R. carries the snub principle to full advantage. This clamp develops approximately the full strength of the conductor and distributes the strain equally on all strands.

It does not damage the conductor.

It is easy to install and has enough margin of holding power so that a moderate tightening of the connector develops the full strength of the wire. Weighing about three-quarters of a pound, this clamp minimizes vibration fatigue strains, prolonging the life of the conductor.



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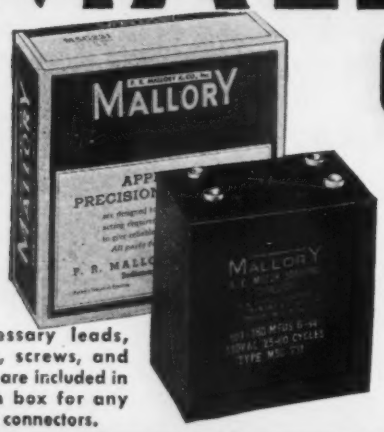

Necessary leads, lugs, screws, and nuts are included in each box for any type connectors.

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POWER COMPANY WINS FRANCHISE ELECTION

Public Service Co. of Colorado was awarded a new 20-year franchise by tax-paying citizens of Denver at a special election held Feb. 11.

The vote was 49,746 for and 5,960 against, a ratio of approval that surprised even company officials and employees. Nearly 90,000 qualified voters did not appear at the polls.

Terms of the contract, as published in ELECTRICAL WEST (January, p. 84), provide an annual franchise tax of approximately $375,000, based on 3% of estimated gross revenue, as compared with $60,000; a rate reduction amounting to some $1,250,000 a year, averaging 13% per customer less than former schedules; and installation at company expense of a $1,000,000 street lighting system with a 9.8% cut in rates for energy.

The franchise makes no change in natural gas rates, but provides for construction of a $12,000,000 pipeline—through Colorado Interstate Gas Co.—from the Hugoton, Kansas, or Amarillo, Texas, fields to supply Denver's rapidly increasing population. The 20-year contract also justifies Public Service Co.'s $27,000,000 expansion program to rehabilitate existing facilities, purchase new equipment and extend its present system.

Management at Public Service Co. overlooked no public relations approaches in the pre-franchise campaign. Endorsement of the franchise proposal by labor groups, by civic organizations and other bodies was publicized at intervals shortly before the election. House-to-house canvasses were conducted by citizens, both in and outside the company, on an hourly pay basis. Special writers on both daily newspapers, *The Denver Post* and *Rocky Mountain News*, were assigned to an intensive study of the franchise, and all facts and figures at management's disposal were made available to them. Open discussions at Denver city council were held, with John E. Loiseau, company president, on the firing line to answer the public's questions. Weekly newspapers of the area frankly urged their readers to vote favorably on the measure.

There was no concerted opposition to the proposition, though an organization known only as Young Democrats of Denver condemned the house-to-house canvass technique as "near-bribery," and urged that the election be postponed until an accurate valuation on Public Service Co.'s assets could be established as a basis for rate making.

The franchise will return the power

concern about 8% in its investment, according to figures accepted by company and taxpayers.

Since the company operates throughout the state, the pattern of rates and a proviso for further rate reductions by Denver's city council, if conditions justify, are considered important as a guide for agreements with towns and cities where franchises will run out shortly. At Fort Collins, the company has been operating without a permit since 1944. Other communities have short-term franchises which will expire in the near future.

Utah Power To Build Steam Plant At Orem

Utah Power & Light Co. will construct a 40,000-kw. steam-electric plant at Orem, 40 miles south of Salt Lake City. In making the announcement, President George M. Gadsby said that delivery of parts for the $5,800,000 plant is not expected until early 1950. Scheduled construction will tie in with expansion plans of the interconnected Idaho Power and Montana Power companies, according to Gadsby. Idaho plans to add 85,000 kw. to generating capacity and Montana will build a 56,000-kw. plant at Flathead Lake. "There is a need in the Intermountain area for steam-electric generation to support and as an adjunct to hydroelectric generation. Looking to the longer future, this plant will prove of great value in supplementing the central Utah Valley propects," Gadsby said.

• LACK of funds has forced curtailment of construction work on Anderson Ranch Dam in Idaho, according to R. J. Newell, USBR regional director. Until March 1, 1947, only vitally essential work now in progress will be continued and until the end of the current fiscal year only operation and maintenance of minimum essential facilities will be provided. Of the $2,847,000 requested $1,234,475 was appropriated for the fiscal year 1947 and under present conditions additional funds will be available only after Congress has passed the 1948 fiscal appropriation bill, which contains a budget allowance for Anderson Ranch Dam of $4,136,000.

• SECOND 115,000-volt line to transmit power from Davis and Parker dams to the Phoenix-Tucson area was to be started during February. The 3-phase, 60-cycle, single-circuit line will run about 125 miles. Contract has been awarded to the J. & J. Construction Co. of Oklahoma City on a bid of $475,165.

A Statement of Major Importance regarding

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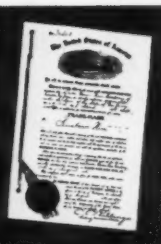

FROM TIME TO TIME, a product is developed which—by virtue of its originality, overall superiority and general acceptance—meets with instantaneous and lasting success. In so doing, it establishes itself as the standard of quality by which all other similar products are judged.

In industry, an outstanding example of this is NICHROME.

NICHROME is a nickel-chromium alloy electrical resistance wire which is made *only* by *Driver-Harris Co.* Further, it is a *trade mark*, officially registered by the U.S. Patent Office on August 11, 1908 more than thirty-eight years ago.

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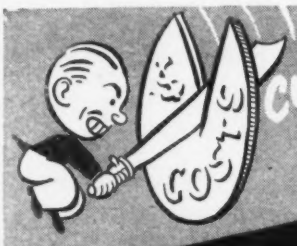

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NEWS ABOUT PEOPLE

● J. FRANK WARD on March 1 became Tacoma City Light superintendent, a position open since resignation of A. F. Darland last summer. Ward had been Bonneville's Puget Sound district manager, going to that office originally in 1940 and returning in 1945 after a two-year absence during the war. His connection with the utility business goes back to 1918.

● WILLIAM P. "TEDDY" BEAR, for many years until his retirement in 1944 in PG and E's general sales department and recently with the U. S. Maritime Commission and Oakland Army base, is now instructor in electrical engineering in the Navy Civil Engineering Corp. Officer Training School at Port Hueneme, near Oxnard, Calif.

● HERBERT V. SALL, previously assistant division superintendent of Southern California Edison Co.'s eastern division transmission, has been appointed division superintendent. T. E. PINCKLEY, formerly acting estimator for the southern division, has been appointed to succeed Sall as assistant division superintendent.

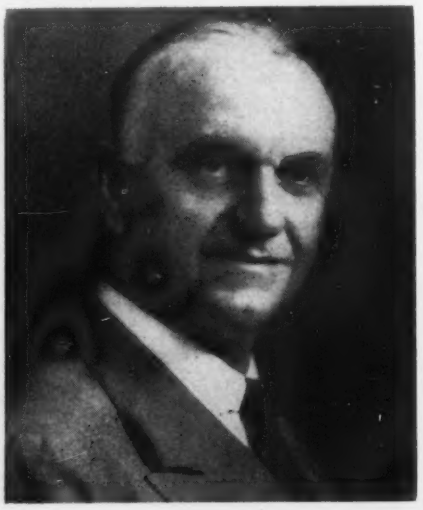
● GAYLE G. ARMSTRONG, Roswell, N. M., has been elected director of the Southwestern Public Service Corp., a utility operating in Texas and New Mexico. Armstrong served early last year as special assistant to Secretary of Agriculture Clinton Anderson, in charge of strikebound packing plants.

● GEORGE L. RICHARDSON, manager of the Wallace, Idaho, division of the Washington Water Power Co., has retired after 43 years with the company. He started as an electrician in 1903, became district superintendent in 1920 and division manager in 1940.

● CHARLES B. KORTEN has been appointed commercial manager of the Cowlitz PUD at Longview, Wash., replacing W. J. MANDLEY, who resigned to enter another line of work. Korten formerly was employed by the district as a civil engineer.

● P. R. NALDER, an electrical engineering graduate of Washington State College in 1933, has been assigned to the Washington, D. C., offices of the Bureau of Reclamation as chief of the division of design. He had been assistant office engineer for the bureau's Columbia Basin project at Coulee Dam since his return from the air corps.

● S. E. GATES retired from General Electric Co. under the organization's pension plan and G. F. MAUGHMER was appointed Los Angeles apparatus department manager to succeed him, effective March 1. Gates has had 42 years continuous service with G-E; was Spokane manager from 1910 to



Gates

1924, when he was transferred to Los Angeles. Maughmer, who had been assistant manager under Gates since April 1945, has been with G-E at Los Angeles and Phoenix for 22 years. He had the job of coordinating company activities in connection with the Metropolitan Water District aqueduct; was granted a patent on certain ventilating equipment which he designed for that project and was given the Coffin award for his work.

● MILES STEEL, Benjamin Electric & Mfg. Co. Pacific Coast manager, retired Jan. 1, after many years of service, and CARL MARTIN has been appointed in his place. Martin also has been with Benjamin some 30 years.

● A. D. "Art" BROWN, manager Los Angeles office, Allis-Chalmers Mfg. Co., has been named manager of that company's Washington, D. C., office. He has been in Los Angeles for the past eleven years.

● PAUL R. POLLOCK has been named manager of the Denver office of Allis-Chalmers Mfg. Co. HENRY H. ROTH, whom Pollock succeeds at Denver, has been transferred to the company's main works in West Allis, Wis.

● FORMER WESTERNER E. O. SHREVE, vice-president of General Electric Co., has been appointed chairman of the National Adequate Wiring Bureau's executive committee, succeeding Herbert Metz of Graybar Electric Co. T. J. Newcomb, merchandise sales manager, Westinghouse Electric Corp., was named the other NEMA representative on the executive committee replacing V. R. Vespard, vice-president of Pass & Seymour.

● EARL R. MCALESTER, former lighting sales engineer for Pacific Gas & Electric Co., and subsequently with Westinghouse Electric Supply Co., and Marinship, has joined the staff of the Sacramento Utilities District as lighting sales engineer.

Maughmer

● GRAYBAR ELECTRIC Co. announces the appointment of J. Henry Wendt as district credit manager for the Central Pacific district, with headquarters in San Francisco, effective Feb. 1. Wendt comes from Graybar's Richmond, Va., house, where he has served as credit manager since 1935. Prior to that he was a credit man at the New York office. He succeeds the late Joseph M. Crotty, whose untimely death on Jan. 3, was a shock to his many friends in the West.

● WARREN L. WHITE has been appointed Salt Lake City street lighting supervisor, succeeding the late Joseph J. Gill. An army officer in World War II, White previously was employed as an inspector in the city health department and as office manager of the public safety department.

● ARTHUR RICHARDSON, who has been purchasing agent of the B. C. Electric Railway Co. for the past 37 years, has retired and has been succeeded by E. B. WILLIAMS.

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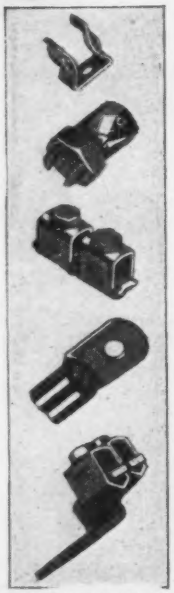

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● GEORGE M. BOWMAN returned to Fresno as city electrical engineer, following five and a half years service in the U.S. Navy, during which he saw the hottest action in the Japan war. He was called to duty June 1, 1941, as lieutenant on engineering duty aboard the *Saratoga*, and was with it for three and a half years, during which it was twice torpedoed. Once his electrical ingenuity in by-passing the blasted switchboard saved the ship from being abandoned. Promoted to a commander, he served in China as commanding officer of a navy group for 14 months at Chungking and Shanghai. Last year he returned to Washington, D. C., and then to Yerba Buena, with rank of captain, on court-martial duty.

● E. C. HERRON was appointed manager of G-E's Lamp Dept., South Pacific sales district in Los Angeles. He succeeds the late E. P. Markee. Herron has been in the lamp business since 1918, when he became contact clerk for Edison Lamp Works in Cincinnati. He later went to Cleveland and from there was transferred to Los Angeles in 1934.

● JOHN L. MCCARTNEY, headworks maintenance foreman at Seattle City Light's Cedar Falls plant since 1908, has retired after 45 years service with the city. McCartney was a member of the construction staff which in 1903 built the Cedar River Crib Dam, the first publicly owned hydroelectric dam in the United States.

● PAUL L. MARBLE is now with the Civil Aeronautics Administration as regional airport lighting engineer covering the four northwest states. He was with Pacific Power & Light Co. for 14 years and with Puget Sound Power & Light for 12.

● WILLIAM L. THRAILKILL, assistant general manager and director of the Washington Water Power Co., has been re-elected vice-president of the National Society of Professional Engineers for the Western area.

● J. H. CLAWSON has been made controller of Puget Sound Power & Light Co. He will continue in the post of assistant treasurer.

Fahlen

● CENTRAL ARIZONA LIGHT & POWER Co. has announced division of its expanded territory into four divisions and appointment of F. T. FAHLEN JR. as vice-president in charge of division operations. Fahlen will be located at Phoenix. Except for two years of service in the South Pacific, where he attained the rank of lieutenant (j.g.) in the Naval Reserve, he has been with the company since his graduation from the state university in June 1933. He joined as a collector and interviewer and worked as watchman, groundman, apprentice lineman and helper in the electric plant before he went into the sales department and then into the district organization.

● M. D. SCHUSTER, general manager of Ray Thomas Co., has announced appointment of Harry Ostrander as sales manager of the company's appliance department and of Howard L. Bredlow as sales manager of the record department. Marshall Lee, formerly in charge of record sales, is on leave of absence due to illness.

● HAROLD AULD, for 13 years Oakland and East Bay representative for the Westinghouse X-ray division, has been named X-ray division manager for northern California and western Nevada, with headquarters at San Francisco.

● LEE G. JOHNS has been named Western States sales manager for Clark Water Heater division of McGraw Electric Co.

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Furnish the same kind of Current as the highlines. Sizes 500 watts to 100 KW. Also Manufacturers of Rotary Converters, Frequency Changers. 32 and 110 Volt D.C. Motors in ¼, ⅓ & ½ H.P. A.C. Motors, single phase in 1½ and 2 H.P. only.

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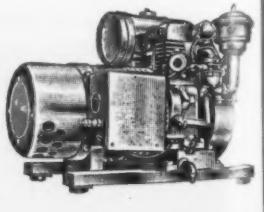

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DC welding machines; electric motor driven generator; single operator type; 200, 300, 400 and 600 ampere capacity.

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AC welding transformers for use in automatic arc welding process.

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All are welders are sold under existing priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the materials offered herein.

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Manufacturers of soldering equipment since 1919

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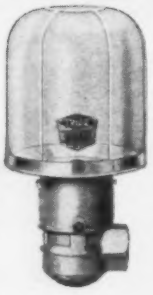

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Deaths

● FRANCIS WILLIAM MIELENZ, 68, retired superintendent of buildings for the Pacific Gas & Electric Co. East Bay division, died recently in Oakland, Calif. Mr. Mielenz attended the Van der Naillen College in Oakland and after being employed for short periods with the old San Francisco Gas & Electric Co. and the Oakland Gas, Light and Heat Co., went to St. Helena, Calif., to become general manager of the Napa Valley Electric Co. He returned to Oakland in 1929, being appointed superintendent of buildings when the Great Western Power Co. was taken over by PG and E in 1930.

● RICHARD MYRON ARMS, 75, superintendent of Seattle, Wash., City Light in 1910 and 1911, died Jan. 30 in that city. He was graduated from the University of Wisconsin in 1894 with a degree in electrical engineering and moved to Spokane, Wash., in 1900, working for two years with the Spokane Power & Light Co. He had lived in Seattle since 1902, being associated with the Seattle Electric Co. until his appointment to City Light. He resigned the superintendency after two years to become an inspector for the Alaska Railroad.

● PAUL DUNBAR, 32, Southern California Edison Co. lineman, was killed in a freak accident while working with a pole removal crew in San Bernardino on Jan. 30. He was touching a truck when a guy wire broke and snapped up from the truck to a 12,000-volt power line, energizing the truck and killing Dunbar. The fire department's resuscitator squad worked more than three hours in a vain effort to revive him.

● EARL P. MARKEE, General Electric Lamp Department manager in Los Angeles since 1919, died on Feb. 2. Markee was born in Minneapolis, Minn. on Nov. 7, 1891. He joined General Electric Co. in 1916 at Portland, and went to Los Angeles three years later to become manager of that office. He was a past president of the Los Angeles Electric Club and active in civic and business groups.

● GEORGE W. ARMIJO, 69, member of the New Mexico State Corporation Commission, died Feb. 16. Armijo had been a member of the Corporation Commission for two years, being appointed Feb. 10, 1945, by the then Gov. John J. Dempsey to fill a vacancy.

● FRANK I. DOANE, 59, electrical and mechanical engineer for the California highway department for the past 12 years, died Jan. 7 in Berkeley.

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TYPE 57-A SIDE BREAK DISCONNECT SWITCH

Model Illustrated
46kv-600 Amp.

Available in
Ratings of
7.5kv to 69kv.
400 Amps. to 1200 Amps.

A Positive electrical contact is assured under all climatic conditions by full-floating contact shoes in weather protected jaw assembly.

B Years of field operation have proven the ruggedness and dependability of the simple hinge mechanism in all-weather operation.

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D Hinge-end shunt provides copper path from blade to terminal. Flexible Copper shunt is tinned for higher corrosion resistance.

E Non-corrosive main bearing requires no lubrication and assures efficient operation in all seasons.

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APRIL ISSUE

ELECTRICAL WEST

Spokesman for the most highly electrified section of the U. S.

NOTES ON THE TRADE

Westinghouse to Operate West Coast Factory

Westinghouse Electric Corp. will take over operation of the Joshua Hendy Iron Works at Sunnyvale, Calif., under a 10-year lease agreement, with option to purchase, it was announced last month by John A. McCone, Hendy president, Charles A. Dostal, vice-president in charge of the Westinghouse Pacific Coast district and Harry F. Boe of Pittsburgh, Westinghouse vice-president.

The 57-acre Hendy plant, with its 1,000,000 sq. ft. of floor space, becomes the largest of 37 manufacturing and repair division plants operated by Westinghouse in 25 states. Other West Coast plants are located at Emeryville, Calif., Los Angeles, Portland, Seattle and Salt Lake City.

In addition to carrying on Hendy's present production of heavy equipment, valves, custom-built machinery and small steam turbines, Westinghouse will make other equipment. The present staff of 1,100 will be increased when operations are in full swing, Dostal said.

During the war, Hendy was licensed to produce, under Westinghouse plans and processes, large marine turbines and gears, thus became the first Pacific Coast firm to build turbine-geared propulsion equipment for the government. The plant was established in 1856 as a metal fabricating concern. At present it has seven manufacturing buildings, a modern office building, a cafeteria, and a large foundry. Four of the manufacturing buildings were built during the war, when Hendy had a peak of 9,000 employees.

Designed to bring certain types of electrical manufacturing, as well as repair work, close to point of use, the Westinghouse manufacturing and repair division plants turn out products ranging from all types of motors, panel boards, transformers and switchgear to electric water heaters and home heating units. The Sunnyvale plant is well equipped with machine tools and already contains giant boring mills and metal planers that will enable Westinghouse to subcontract work for other heavy equipment manufacturers on the West Coast, Dostal said.

The contract will insure continuing operation of the plant at a scale approaching wartime level, McCone pointed out. Hendy will continue to operate its Torrance, Calif., plant.

Mackall (right) with George Topham Jr., Crouse Hinds San Francisco sales manager, shows traffic device

● K. W. MACKALL, manager of the Traffic Signal Dept., Crouse-Hinds Co., was a visitor to the West Coast early in February consulting with city and state officials in their problems of traffic control and the equipment for handling it.

● GENERAL ELECTRIC APPLIANCES INC. expects to occupy early in March, remodeled headquarters at 150 W. Jefferson St., Los Angeles, according to S. B. Maher, branch manager. The half-block long, two-story structure will house all activities of the branch and will have spur track and loading dock facilities. A complete display room will include an operating kitchen and laundry for demonstration and an auditorium for dealer meetings.

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Westinghouse Supply Opens Fresno Branch

Westinghouse Electric Supply Co. has established a Fresno, Calif., branch headquarters at 2608 California St., it was announced by Charles R. Matthews of San Francisco, northern California district manager. The distribution branch will be in charge of John B. Harvey, former northern California district credit manager.

Heretofore the supply company has been represented at Fresno by two field men but shipments have been made from San Francisco. The two representatives, Eric B. McKinley and Harold S. Baker will be on the new staff as apparatus and supply representative and appliance representative respectively. Others on the staff are Harold Robertson, apparatus and supply representative; Adrian M. Springer, stores manager; Eugene D. Kelly, appliance representative.

● ARMSTRONG CONTROL CO., INC. has opened a new factory in Portland at 8816 SE 17th Ave. Formerly the Armstrong Heat Control Co., the organization will manufacture specialty transformers including "Insta-Start" for fluorescent lighting, ignition for oil burners and gaseous tube for decorative and sign lighting. These transformers will be manufactured under license of the France Mfg. Co. of Cleveland, Armstrong having the distribution west of the Rockies, and in Alaska, the Hawaiian Islands and the Orient. Although experiencing the common difficulty in securing materials, Armstrong is in quantity production with the Insta-Start fluorescent ballast and is making both the 110- and 220-volt, 2-lamp, 40-watt ballasts, according to S. MacMurray, general manager. Distribution plan will be announced later, he said.

● A. J. SCHMITZ will continue to direct Allis-Chalmers operations in the Pacific Coast area under the company's new regional set-up announced recently. W. C. Johnson, vice-president in charge of the general machinery division, announced that the change, aimed at furthering customer service, will group district offices into four regions operating as self-contained field units.

● TRUMBULL ELECTRIC MFG. CO., is to move its Los Angeles operations to a new 60,000-sq. ft. building on five acres of ground at 11115 Van Owen St., North Hollywood. It has been at 810 E. Third St., Los Angeles for a number of years. A. G. von Normann is manager.

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Sectional territories open from coast-to-coast to sales organizations qualified to do a bang-up job.
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FIELD ENGINEER
Prominent midwestern manufacturer of electrical distribution equipment has a place on the field staff for a young, alert, aggressive electrical engineer.
This man should be familiar with electrical transmission and distribution practice. Territory will be western United States and man should be able to stay in field for extended periods.
Good starting salary and excellent opportunity for advancement. Car and expenses paid. Give complete details of education and past experience. Personal interview will be arranged.
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One (1) experienced graduate engineer, responsible charge electrical engineering and design of steam-electric and hydro-electric power plants and high voltage substations. Applicants please furnish personal data and Experience Record.
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Portable unit for both field and central office use. Equipped for talking, signaling and testing magneto or common battery telephone systems and utility power control circuits. Has self-contained hand generator.
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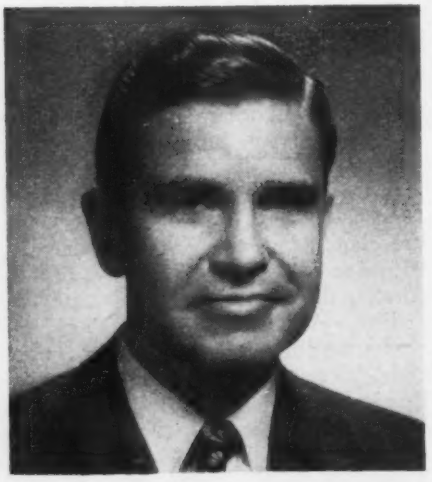
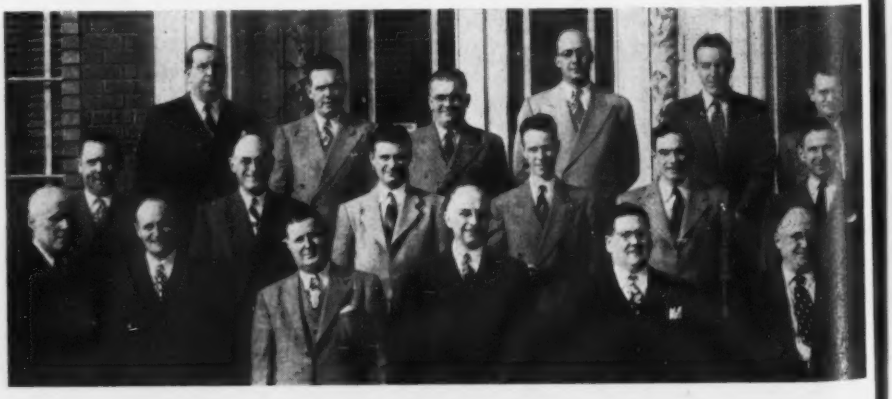
PROFILES

Right: Henry Kruse, Puget Sound Power & Light Co. general sales manager for the past two years, has been made general commercial manager. Kruse joined the organization in 1913 following graduation from the University of Washington and has worked in each of the company's division headquarters and the general office

Below: Recent Westinghouse appointments in the West include Joseph R McGilvray (right), transferred from New England to Emeryville, Calif., as manager of the Pacific district manufacturing and repair department, and John B. Harvey (left) manager of Westinghouse Supply's new Fresno branch headquarters (story on p. 117)



Pictured at last month's annual sales meeting of Western Insulated Wire Co. at Los Angeles: left to right, (front) Nelson Rush, Los Angeles; Jack Bird, Seattle; William Terry, Kansas City; Mil Klicpera, Houston; Frank Russell, Philadelphia; William Weston, San Francisco; (center) Jack Miner, Detroit; E. H. Lewis, company president; Gene Huxley, chemist; Thomas Dorsey, Seattle; Rollin Dorsey, sales; Herman Libkind, assistant works manager; (back) Arthur Cutler, field engineer; Walton Armour, field engineer; Frank Keenan, secretary; John Carder, Albuquerque; Thomas Deskin, production; Willis Rice, process engineer



FOOTNOTES * ...to the California Scene

SCENE 1: HOMEMAKING

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No wonder she smiles! No wonder she feels like a queen! No wonder her life is *better* in Northern California.*

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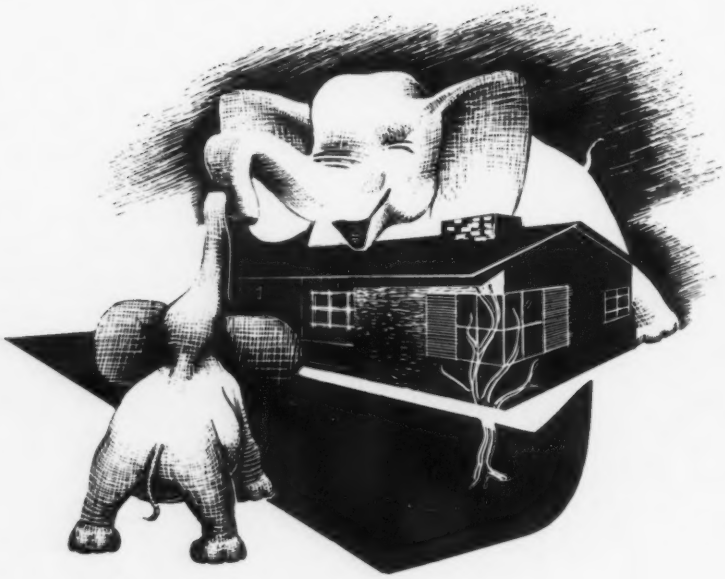

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People whose homes are inadequately wired can't get full benefit from their electrical service. Without plenty of outlets, switches and sufficiently heavy wiring, these houses are off the prospect list for many appliances.

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